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PRUSSIAN BLUE, OR HYDROCYANATE OF IRON.

By FERD. F. MAYER, of New York.

For some time back a preparation has been introduced to the attention of physicians, professedly for the cure of epilepsy, under the title, "Hydrocyanate of Iron," as it appears an alias for the officinal Ferri Ferrocyanuretum or Prussian Blue, which, after the precedence of Dr. Kirchoff, of Ghent, and Dr. Bridges, of Philadelphia, had become a standard remedy in that dread disease many years ago. Since an impression has gained ground, and been upheld by diverse notices in some of the pharmaceutical and medical papers, that the hydrocyanate of iron in question is a new and altogether distinct, as well as a pure chemical compound, in short, the long sought for proto-cyanide of iron, it may not be amiss to place the matter in its true light by an analysis of the article sold under that name at a high price, partly, very probably, because its supposed mode of preparation is somewhat more expensive than that of the officinal ferrocyanuret of iron.

The name of hydrocyanate of iron, Ferrum Hydrocyanicum, although an unchemical one, has been for many years a synonym for Prussian Blue; and whatever might be the impression of a chemist as to the probable nature of such a compound, any pharmacist would unhesitatingly dispense the officinal Prussian Blue, unless the practitioner insisted upon its being a different preparation.

An ounce-bottle of the substance in question, labelled "Hydrocyanate of Iron—Dose: $\frac{1}{2}$ grain twice a day—Tilden & Co., New York," was handed to me for examination, with the request to find out, if possible, the formula for it, as it was the compound

spoken of in a number of the Journals under the title of Dr. McGuigan's Hydrocyanate of Iron.

It is a dark blue powder, of a very dull tinge, somewhat gritty, and air-dry. It dissolves in cold or hot water, leaving behind but a trace of what appears to be dust. Hydrochloric acid dissolves out some perchloride iron, which on dilution produces a finer blue. Caustic Potassa precipitates hydrated peroxide of iron, the decolorized, or rather yellow solution containing now ferrocyanide of potassium. On calcining the substance at a low heat it gives off a somewhat empyreumatic odor, and is gradually converted into a deep reddish brown powder, which on being washed with water yields up a considerable proportion of cyanide of potassium, or when the heat applied has been too high, principally carbonate of potassa. The red powder, if properly oxidized by exposure to the air while hot, dissolves completely in strong hydrochloric acid; it sometimes leaves behind a black powder, which dissolves in nitro-muriatic acid, and proves to be carburet of iron.

The quantitative assay (in which I employed altogether the graduated solution of Dr. Mohr, Fresenius, and Neubauer, as particularly adapted to this kind of compounds) gave the following results:

I. One gramme of the powder, rubbed fine, placed in a flask and dissolved in water, then decomposed by caustic potash, boiled up and filtered. This operation was repeated three times in succession with one gramme each. The filtrate, acidulated and measured with permanganate of potassa, showed:

$$=0.0942 \text{ gramme} = 9.42 \text{ p. c. of Fe} =$$

$$=0.1211 \text{ " } = 12.11 \text{ p. c. of FeO} =$$

$$=0.1816 \text{ " } = 18.16 \text{ p. c. of FeCy} =$$

$$=0.7102 \text{ " } = 71.02 \text{ p. c. of FeCy} + 2\text{KC}y + 3\text{HO (yellow prusiate.)}$$

$$=0.3633 \text{ " } = 36.33 \text{ p. c. of FeCy} + 2\text{HCy (ferrocyanic acid.)}$$

II. The hydrated peroxide of iron obtained under I. collected on the filter, well washed with water and dissolved in hydrochloric acid, showed:

$$0.1417 \text{ gramme} = 14.17 \text{ p. c. of Fe} =$$

$$=0.2024 \text{ " } = 20.24 \text{ p. c. of Fe}_2\text{O}_3 =$$

III. One gramme of the substance was calcined until converted into a uniform brownish red powder, placed on a filter and completely exhausted with water, the filtrate evaporated to dryness, neutralized with hydrochloric acid, calcined, and the chloride of potassium thus obtained measured with a graduated solution of nitrate of silver. The three experiments made in this manner gave :

0.0895	gramme	=	8.95	p. c. of KCl	=
= 0.0469	"	=	4.69	p. c. of K	=
= 0.1266	"	=	12.66	p. c. of FeCy + 2KCy + 3Ag	=
= 0.0324	"	=	3.24	p. c. of FeCy	=
= 0.0648	"	=	6.48	p. c. of FeCy + 2HCy	=

The analysis then stands :

0.2024	gramme	=	20.24	p. c. of Fe ₂ O ₃ , (peroxide of iron.)
0.2984	"	=	29.84	p. c. of FeCy + 2HCy (ferrocyanic acid.)
0.1266	"	=	12.66	p. c. of FeCy + 2KCy + 3HO (ferrocyanide of potassium.)
0.3726	"	=	37.26	p. c. of water, partly free, and in part held in combination.

1.0000	100.00
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This substance is therefore a mixture of ferrocyanuret and peroxide of iron, with ferrocyanide of potassium. From its color, which is very unsightly compared with that of common Soluble Blue, I concluded that it was not the precipitate formed by yellow prussiate in a protosalt of iron, but the preparation mentioned in vol. 26 (1854), page 504, of the American Journal of Pharmacy, and prepared somewhat in accordance with the formula there suggested by the Editor of this Journal.

Gmelin states : "On mixing a solution of cyanide of potassium with one of a ferrous salt, a light reddish brown precipitate is formed, partly soluble in acids, the composition of which has not yet been determined. This is probably the true proto-cyanide of iron, FeCy."

That this precipitate be free from potassa is, to say the least, very doubtful. It is well established that the alkaline cyanides immediately on being brought into contact with salts of iron, form alkaline ferrocyanides, or hydrocyanates

of the protoxide of iron and potassa (or soda), which at once seize upon whatever oxide of iron is present to form the soluble combinations of ferrocyanide of potassium (or sodium) and of iron, similar to the white precipitate brought on by prussiate of potassa in solutions of protosalts of iron. The manufacture of prussiate of potassa is partly founded on this very reaction.

This reddish precipitate must be considered as a combination of the white precipitate mentioned and cyanide of potassium, which, on digestion, gradually passes into yellow prussiate, ferrocyanide of potassium. The color can be no objection, when it is considered that ferrocyanide of potassium, though consisting of two supposed-to-be colorless salts, has a more or less rich yellow color.

An experiment to illustrate this formation of prussiate of potassa is easily made, even with the common fused cyanide of potassium, (which, besides a varying proportion of cyanide, contains hydrate, carbonate, cyanate and formiate of potassa). By adding a large excess of this salt to a solution of a ferrous salt, protosulphate of iron for instance, a reddish brown precipitate is formed, which turns rapidly dark, but dissolves on heating, with the exception of a trace of peroxide of iron, and this solution forms Prussian Blue with perchloride of iron.

On repeating the experiment with a strong alcoholic solution of the cyanide, pouring off most of the supernatant liquid and replacing it by fresh spirits, it will be found that as soon as the dark precipitate has somewhat settled, yellowish white flakes appear suspended in the liquid, which prove to be ferrocyanide of potassium, and in the course of a few days the whole precipitate left to itself under alcohol will be found to be converted into that salt.

When the excess of cyanide of potassium has not been so large, the ferrocyanide of iron and potassium can, of course, not all be converted into yellow prussiate, and this is especially the case when the common cyanide of potassium has been used, which, in contact with a salt of iron, forms also a certain amount of hydrated or carbonated oxide. Still, all cyanide of potassium forms a proportional quantity of ferrocyanide, which partly forms a more or less colored Prussian Blue, partly remains, combined with the precipitate, and causes its solubility.

It is of no avail to wash the precipitate with water, nor can washing with *alcohol* produce a pure cyanide of iron, since the prussiate of potassa contained in the precipitate is altogether insoluble in spirits.

If the cyanide of potassium used was pure, the precipitate formed by an excess of it dissolves completely in the liquid. Obtained from the common cyanide, it is mixed with more or less hydrated protoxide of iron, which does not at once combine or dissolve with the excess of cyanide or ferrocyanide already formed, but does so when it has been converted into peroxide by exposure, in which condition it combines with the alkaline ferrocyanide to form soluble Blue; and this is the substance examined.

Neither the proto- nor the per-cyanide of iron have ever been obtained in a pure form. The compound FeCy , 2HCy , ferrocyanic acid, the theoretical acid of the yellow prussiates, is a whitish, generally slightly yellow or blue, powder, which bears heating to 212°F ., a little above that point gives off hydrocyanic acid and water, leaving a grayish yellow substance, of what composition is not exactly known, which, at a slightly elevated temperature, changes to a black powder, which consists of 12 equivalents of iron, 20 of carbon, and 5 of nitrogen. A solution of this acid on boiling precipitates a white substance, which Berzelius supposes to be a protocyanide of iron, though it could not be determined whether it contained water or not, as it changes instantly, in contact with the air. The substance obtained by heating ferrocyanide of ammonium is probably purer than that had from ferrocyanic acid, but, like the former, not constant enough to allow of being analysed. The circumstance that these substances, on being heated with hydrochloric acid, give off hydrocyanic acid, speaks for the presence of the elements of water in them. Chemically pure Prussian Blue suspended in water, and thus treated with sulphuretted hydrogen, furnishes a white product, which undoubtedly contains protocyanide of iron; but mixed with a quantity of sulphur equivalent to the peroxide of iron reduced by the hydrogen. I say peroxide of iron, for whatever symbols may be used for convenience' sake, all the mixtures comprised under the name of Prussian Blues contain water chemically combined, and always enough to constitute hydrocyanates of protoxide and of per-

oxide of iron. Thus, chemically pure Prussian Blue contains the elements of twelve equivalents of water, and it is to the latter that it owes its color, since it loses it, when heated, besides the cyanogen contained being either lost or dissolved in its elements.

In order to find out whether the ferrocyanide of potassium present in the so-called hydrocyanate was retained merely as a mechanical admixture, caused by the use of alcohol in washing it, I subjected to examination two fine specimens of the official Prussian blue, the one (I.) from our leading chemical manufacturers, the other (II.) from a prominent German pharmacist of this city.

I. is a powder of a beautiful lazur-color, perfectly insoluble in pure water, and as completely soluble in prussiate of potassa.

II. is in lumps, rather heavier than I., with the characteristic bronze fracture belonging to pure, or well prepared, Blue; in its qualitative reactions identical with I.

	I.	II.
Iron	33.2 p. c. of which	32.40 p. c. of which
as FeCy	14.80	as FeCy 13.35
as Fe ² O ³	18.41	as Fe ₂ O ₃ 19.05
Cyanogen	47.20 p. c. of which	34.26 p. c.
4.24 in the prussiate.		
Potassium	4.30 p. c.	2.93 p. c.
Taking as above the FeCy as ferrocyanic acid, we have		
	I.	II.
Peroxide of Iron	26.30 p. c.	27.21 p. c.
Ferrocyanic Acid	51.49 p. c.	47.44 p. c.
Ferrocyanide of Potassium	11.48 p. c.	7.90 p. c.
Water	10.73 p. c.	17.45 p. c.
	100.00	100.00

which carried out gives

	I.		II.	
	With Prussiate of Pot.	Without Pr. of Pot.	With Pruss. of Pot.	Without Pr. of Pot.
Iron	31.68	35.21	32.40	34.79
Carbon	19.83	22.04	15.81	16.97
Nitrogen	23.13	25.70	18.45	19.81
Water	15.34	17.05	26.46	28.93
Prussiate of Potassium (anhydrous)	10.02		6.88	
	100.00	100.00	100.00	100.00

It will thus be seen that, although these two samples of ferrocyanuret of iron contain, the one 11½, the other 8 p. c. of ferrocyanide of potassium (cryst.), they are insoluble in water, but become so on adding some prussiate to them. It is, therefore, not merely the presence of the potassium salt which causes the solubility, but it is required to be in mechanical admixture to render Prussian Blue soluble. This is precisely the case with the hydrocyanate examined, from which it has not been removed by water, and the amount of prussiate is sufficient to hold this basic ferrocyanide of sesquioxide of iron in solution. The smallness of the dose explains itself by the ready solubility of the substance.

[NOTE.—It may be well to append a few words to Mr. Mayer's paper, explanatory of our connection with what has been called "Dr. McGuigan's Hydrocyanate of Iron. Some time previous to November, 1854, Dr. McGuigan, of Keokuk, Iowa, wrote to us in relation to "Hydrocyanate of Iron," which he was desirous of procuring for use in Epilepsy, for which disease he had seen it strongly recommended, at the same time intimating that the article wanted was not Prussian Blue. In reply we wrote to him, that strictly speaking, no such preparation had yet been made, but that the nearest approach to it that we could offer, was the precipitate formed by cyanide of potassium, in a proto-salt of iron, freed from water by aid of alcohol, but that in the process of drying it became altered. Such as it was, it was sent to him, and afterwards noticed at page 504 of this Journal for 1854, with the details. Dr. McGuigan afterwards wrote stating that he had derived good results from the use of the powder sent to him. He afterwards, we believe, induced Tilden & Co. to prepare the preparation for him and others. Our own view of the matter is, that the substance originally intended by M. Roux and others, as mentioned by C. Bernard, is pure Prussian Blue, (see *Journal de Pharmacie*, May, 1853, page 388) because it is there spoken of as Cyanuret of Iron and Hydrocyanate of Iron, both of which names are synonyms of Prussian Blue, in France. In the last paragraph it is remarked, "Let us add that Cyanuret of Iron, nearly abandoned in France, is in Germany and the United States considered as an excellent succedaneum to Cinchona, and that it has been much employed as an anti-spasmodic, especially in chorea, hysteria and Epilepsy." Whether the association of Ferrocyanide of Potassium with Prussian Blue, as shown by the analysis of Mr. Mayer, adds to its power by giving it solubility, we are not able to determine, but it is probable that it may be true.—EDITOR AMER. JOUR. PHARMACY.]

SALTPETRE IN HYOSCYAMUS.

By F. MAHLA, M. D.

During the preparation of the alcoholic extract of *Hyoscyamus niger*, according to the directions of the U. S. Dispensatory, I observed, after the obtained tinctures were evaporated to about $\frac{1}{4}$ th, the formation of copious crystalline masses. I separated a portion, and after purifying them by repeated crystallizations, I obtained large transparent crystals. These crystals were subjected to analysis, and proved to be nitrate of potassa. I cannot state in what quantitative proportions saltpetre is obtained in the leaves, but think if I had separated it carefully I would have obtained from 50 lbs. of leaves at least 1 lb. of the dry salt.

Chicago, June 21, 1859.

THERAPEUTICAL APPLICATIONS OF PROTEIN.

By J. C. HUPP, M. D.

[NOTE.—We have received the following note, with the copy of the one that elicited it, from Mr. Bocking, of Wheeling, Virginia, in reference to Protein. It appears that certain correspondents of that gentleman, desirous of knowing to what uses Protein was applied, had written to him for information, which he obtained by application to the prescriber.—*Editor Am. Jour. Pharm.*]

Wheeling, Va., July 20th, 1859.

E. Bocking, Pharmacist:

Dear Sir: In answer to yours of 14th inst., I cheerfully communicate the "uses" to which I have applied the Protein, which you have been ordering for me. As a remedial agent, I have used it with results the most satisfactory. Two causes prevented me from using it more generally than I have done, namely: the *scarcity of supply* and the *cost* of the article. When I have desired an aid to the assimilative process, I have invariably found a reliable adjuvant in Protein. When the nutritive system was at fault, I have not failed to find the appetite rapidly improve from its use. I have employed it with satisfaction in various forms of skin diseases, combining in the treatment alteratives and tonics as indicated. Those inveterate and otherwise vexatious and annoying skin diseases incident to childhood, such as *eczema* and *impetigo capitis*, I have seen rapidly

disappear under its use, the child at the same time improving in health generally, and no untoward symptoms arising on the disappearance of the dermal inflammation. I have used it suspended in simple syrup on the glycerole of the hypophosphites, giving to a child under five years of age from 2 to 5 grains thrice daily. Children take it without disgust or loathing.

I have thus hastily answered your inquiry, and remain,

Yours, respectfully,

J. C. HUPP, M. D.

REMARKS ON MONSEL'S PERSULPHATE OF IRON.

BY WILLIAM PROCTER, JR.

M. Monsel, whose name attaches to this preparation, is at present in the position of Pharmacien Major in the French service. In 1852, whilst attached to the medical corps of the French army at Rome, he published, in a letter dated Oct. 18th, of that year, the fact that persulphate of iron was the most powerful hæmostatic among the agents then known, and he has the credit of having first noticed this property of the salt.

When Pharmacien Aid-major, at the Military Hospital of Bordeaux, M. Monsel published an essay in the *Bulletin de Therapeutique*, which M. Soubeiran republished in the *Journal de Pharmacie et de Chimie*, page 208, Sept. 1857, with a note of approval. The following is Monsel's process and comments as there detailed:—

“Take of distilled water 100 grammes,
Sulphuric acid (60° B.) 10 grammes.

Heat the mixture to ebullition in a porcelain capsule capable of holding a pint, and add:—

Protosulphate of iron, 50 grammes,

After the solution is completed, throw into the boiling liquid, little by little:—

Nitric acid (35° B.) 16 grammes.

When the violent evolution of red vapors has ceased, add in portions:—

Protosulphate of iron, pulverised, 50 grammes.

The solution of this new portion of sulphate of iron disengages more red vapors. Lastly the volume is completed to 100

fluid grammes, by the addition of q. s. distilled water ; allow it to cool and filter.

"The clear solution marks 45° of Baumé's pesé-sels. It has a very deep red brown color, is inodorous, and is extremely astringent to the taste without causticity. When largely diluted with water it separates after many hours into a soluble acid sulphate and an insoluble subsulphate. It concentrates by evaporation to the consistence of honey, and if then spread on plates of glass it may be dried at a temperature above 95° Fahr., and obtained in brilliant red scales like citrate of iron. These scales retain 25 per cent of water, dissolve easily in a small quantity of water without decomposition and reproduce the original solution. When evaporated with less care to dryness, a greenish yellow anhydrous salt is obtained, soluble slowly in cold water, requiring 48 hours to reproduce the original solution, and immediately in boiling water except a slight yellow residue.

"The salt in scales is soluble in alcohol without decomposition. The solution at 45° B. is susceptible of dissolving hydrated sesquioxide of iron by digestion, but it cannot be evaporated without decomposition. When sulphuric acid is dropped into the solution it is decolorized, and an excess of acid gives a solid compound, white as plaster.

"Particular attention is directed to the manner in which it comports itself with the albumen of eggs and with blood ; some drops produce a very voluminous and very consistent clot, absolutely insoluble, which continues to swell and harden for many hours. The new sulphate contains $2\frac{1}{2}$ equivalents of sulphuric acid to one equivalent of sesquioxide of iron, and it is certainly preferable to the sulphate of the peroxide described by Soubeiran, which is very caustic and contains a great excess of nitric acid."

M. Soubeiran remarks in his note at page 210, "I have repeated the experience of M. Monsel ; it is perfectly successful, and his process will be accepted always for procuring a solution of the ferric sulphate. The salt dried in a stove is so deliquescent as not to be managable, and if it is intended to preserve it in a dry state, it is necessary to have recourse to greater heat which renders the product like that by the old method." In a more recent paper, (*Jour. de Pharmacie et de Chimie*),

July, 1859, page 35), M. Monsel, after recapitulating his process, noted above, suggests that the quantity there produced should be shaken with a few grammes of linseed oil at intervals during 12 hours, to completely remove all traces of nitric odor, and which tends to preserve it.

From the experiments made at the Val de Grace at the request of the Council of Health by M. Poggiale, on dogs and rabbits placed in the same condition, it resulted that the sulphate of the peroxide of iron is a hæmostatic as powerful as the perchloride of iron, and that in two cases a prompt cure was obtained, although the wounds were very serious and large vessels had been severed.

The following is the formula for Monsel's solution rendered in official weights and measures:—

Take of Distilled water, three fluid ounces,

Sulphuric acid two drachms and a half (Troy.)

Protosulphate of iron, twenty-five drachms (Troy).

Nitric acid 35° B. four drachms (Troy.)

Add the sulphuric acid to the water in a porcelain capsule and heat it to boiling; powder the sulphate of iron, and add one half of it to the acidulated water; when dissolved, pour in the nitric acid little by little. When the red fumes cease to be developed, add the remainder of the sulphate of iron, and stir with a glass rod till dissolved, and the effervescence ceases. Continue the heat until the solution, which at first is dark colored, has become reddish-brown, and measures three fluid ounces and three fluid drachms. The nitric acid must not exceed 35° B.

The specific gravity of this solution is 1522. When it is carefully evaporated in a capsule, removing the pellicle which forms on the surface from time to time, it gets exceedingly tough like an extract, and when dried on glass in transparent laminæ; it is very difficult to remove it, owing to strong adhesion; moreover it is so deliquescent that the drying cannot be well performed in the open air, but requires a stove heat.

In reviewing the process of M. Monsel it would appear that he employs 100 grammes of water, and 100 grammes of sulphate of iron, besides the sulphuric acid, and the process does not involve much evaporation, yet at the close the whole is to measure only just as much as the water originally employed, viz: 100

fluid grammes. It would seem more appropriate to say, "evaporate until the solution measures 100 fluid grammes," because on trial the resulting solution measured 130 fluid grammes, and had to be evaporated nearly one fourth of its bulk to get the prescribed measure. This discrepancy between theory and practice, has arisen from his lengthening the first part of the process, so that more waste of water occurs than is needful. It is better that the application of heat should be continued *after* the last addition of sulphate of iron than before, because owing to the tendency of a solution of sulphate of iron to dissolve and retain deutoxide of nitrogen, much of this gas remains in the solution giving it a blackish brown color. The presence of this gas is evidenced by the escape of red vapors and effervescence when the heat is as great as 212° or more, without boiling, and its absence is shown by holding a piece of paper moistened with solution of proto-sulphate of iron close to the surface of the heated solution, which should *not* be colored if *no* nitrous acid is forming at the surface from the union of deutoxide of nitrogen with the oxygen of the air.

M. Monsel appears to lay much importance on the fact that the proportion of sulphuric acid in his salt is below that necessary to make a regular ter-sulphate of iron. The merit of his process, if its product is really better adapted for therapeutical use than the ordinary solution of persulphate of the Pharmacopœia directed in the process for hydrated sesquioxide of iron, rests in the fact that by using just the quantity of proto-sulphate that is necessary to decompose all the nitric acid, he insures, without failure, the absence of that acid from his solution, which in fact may be viewed as a mixture of the ter-sulphate and bisulphate of sesquioxide of iron. M. Monsel is perhaps wrong, in attributing the formula $2(\text{Fe}^2\text{O}^3) \cdot 5(\text{SO}^3)$ to his salt which may be represented by the formula, $\text{Fe}^2\text{O}^3, 3\text{SO}^3 + \text{Fe}^2\text{O}, ^32\text{SO}^3$, salts which are known to exist.

As in the next Pharmacopœia there is a strong probability that a solution of sesquisulphate of iron will be made a distinct official preparation with a view to its use in making hydrated sesquioxide of iron, Prussian Blue, etc., it will hardly be necessary to employ a special formula for producing a solution for hæmostatic purposes, because with the requisite precautions in constructing

the formula it will be easy to get a salt neutral in composition and free from NO^3 which will replace the salt of Monsel in all respects as a coagulative astringent. At a more convenient season the writer proposes to return to this subject, and by the aid of his medical friends have ascertained by adequate trials the relative efficiency of the regular and of Monsel's sulphate in surgical practice.

SOLUBLE CITRATE OF MAGNESIA.

It is undoubtedly a desideratum to get a solid Citrate of Magnesia that is soluble in water and may be used when required in graduated doses. It is well known that Dorvault and others have published formulæ for producing such a preparation. All seem to unite in the conclusion that it is necessary, in order to get a soluble citrate, to unite the magnesia with the citric acid through the agency of its water of crystallization only, as where the salt is in presence of an excess of water it appropriates sufficient to make the crystalline tribasic salt with 14 equivalents of water, too insoluble for use.

It is also well known that Solution of Citrate of Magnesia is often found to be unpleasantly acid, the excess being greater than is desirable for controlling the magnesian taste. A well prepared solution leaves nothing to be desired except its ineligibility for transportation by travellers, and its liability change by keeping. It is well, therefore, whilst retaining this excellent preparation, to aim at perfecting the solid citrate, so that it will afford a good substitute for the solution for travellers and others. These remarks have been called forth by the following letter to the Editor.

Richmond, Indiana, July 18, 1859.

Respected Friend,—My almost forgotten promise to send a sample of our "Soluble Citrate of Magnesia" was called to mind a day or two since, and I now send two packages; they are taken from a lot made for our regular custom, and differ in no wise from that always made. We have kept them as long as four months, in which time the powder appears to cake, but is easily broken up, when it dissolves as readily as ever, and produces as full cathartic effect as the fresh. We have made and sold them for eighteen months or more, and the demand is larger now

than ever. We have made no effort to introduce them into general use, beyond our own city, but use from forty to fifty pounds of citric acid a year, in its preparation, so that we feel that its use as a reliable cathartic is fairly established. It produces no sickness or pain in its operation; is mild, but very thorough in its action, and is prescribed by all of our regular physicians who deal with us, and most generally in fully half to three fourths of the cases requiring cathartics. Its composition is citric acid three parts and calc. magnesia one part, incorporated by aid of the water of crystallization only.

In reference to the solubility of strychnine, we have as yet received nothing corroborating or disproving our experiments, and feel anxious to hear from you. We have repeated the experiments with reference to its solubility in absolute and officinal alcohol, and find them to fully sustain the first. Two grs. powdered cryst. strychnine placed in one ounce absolute alcohol, and one gr. in one ounce of alcohol of sp. gr. .835, dissolved very soon, and entirely, so far as the eye is a guide, and we know of none better.

Respectfully,

PLUMMER & KELLY,

Per J. W. Plummer.

Each package contains four powders, the united weight of which is a little over an ounce and a half. As received, the powder had caked; one of them put into a tumbler dissolved in 15 minutes, with the exception of a few grains of magnesia, and afforded a perfectly neutral solution. It would, with a little more of the acid, have made a clear solution and more pleasant to the taste. They have on trial been found to come up to the opinion expressed by the manufacturers.

In relation to the answer regarding the solubility of strychnia, we cheerfully admit our obligation to those gentlemen to give it, but it has been put off from time to time for a more convenient opportunity, and is not yet accomplished. A mere repetition of their trials, would have been attended with little trouble, but it has been intended to so conduct the experiment as to give rigid results as to the solubility of that potent alkaloid. They will therefore give us more time, when the pressure of labor for the Association is less heavy than at present.—EDITOR AMER. JOURN. PHARM.

PHARMACEUTICAL NOTICES.

Liquor Ferri Iodidi.

Much has been written on this instable preparation. As we have had no difficulty with it for the past three years, we would like to add our mite to the common stock as follows :

R. Iodine	•	•	℥ij.
Iron	•	•	℥i.
Sugar	•	•	℥xx.*
Water	•	•	f.℥x.

Mix the iodine with five fluid ounces of water in a flask, add the iron filings and occasionally agitate the mixture, until the iodine has entirely combined with the iron (known by the light green color produced,) filter through paper into a flask containing the sugar, wash the filter with the remaining five fluid ounces of water and *boil* thoroughly for several minutes; a slight scum will arise, which remove by draining; bottle, cork tightly until cold, then *agitate* sufficiently to *incorporate* the water, which will have *condensed* in the neck of the bottle, and nothing further is necessary, as it will keep loosely stopped for an indefinite period, the strength is the same as the officinal, and the increase of sugar does not seem objectionable.

Hydrargyri Iodidi Rubri.

Many who have prepared this article have no doubt noticed the waste incurred by its adhering to the sides of the vessel used in precipitating it, and also to the filter; we have adopted the plan of having both solutions *hot* and more concentrated at the time of precipitation, by which means the iodide is thrown down somewhat more dense and the "pasty" character avoided.

*[NOTE. It is presumed that "Thuja" intends the sugar to be weighed with avoirdupois weight. ℥xx. troy with ℥iiss. of the iodide of iron would hardly be retained in solution in the bulk of f℥xx., as we know it would not be in the absence of the iodide. The anonymous position assumed by Thuja prevents our consulting him, and suggests the propriety of his dropping his "nom de plume."—ED. AM. JOUR. PHAR.

Liquor Arsenici et Hydrargyri Iodidi.

In preparing this, we have sometimes had a *red* instead of pale straw-colored product, this we believe arises from free iodine contaminating the iodide of arsenic; it can be removed by boiling in an evaporating dish, but believe not without loss, owing to the volatility of the arsenic salt.

Vinum Ergotæ

We have prepared by first treating the ergot in fine powder with *pure ether*, until deprived of its fixed oil, and then after the removal of the absorbed ether, by evaporation, carefully displacing with Madeira wine. The preparation has certainly more taste, but we have had no evidence that it is therapeutically improved.

Tinctura Myrrhæ.

The use of sand in the manufacture of this preparation by displacement we have found to be entirely unnecessary, as there is sufficient gum in myrrh to prevent the resin from adhering and becoming clogged. The operation is also more satisfactorily conducted.

“THUJA.”

SOME FACTS IN RELATION TO THE SOLUBILITY OF PHOSPHATE OF IRON.

By JOHN M. MAISCH.

Philadelphia, August 10th, 1859.

Editor of Amer. Journ. Pharm.:

DEAR SIR,—In Vol. xxix., page 404, you have given a formula for the preparation of a syrup of pyrophosphate of iron, in accordance with the recommendation of E. Robiquet, by dissolving this ferruginous salt by means of a solution of citrate of ammonia. I have repeatedly prepared it in the way there indicated, but within a few days I have come to the conclusion that the preparation of the pyrophosphatic salt is entirely unnecessary for the purpose.

If a solution of citrate of sesquioxide of iron is mixed with an alkali, no precipitation takes place, since the newly formed double salt is easily soluble in water; the same behaviour as the alkalies, has a solution of pyrophosphate of ammonia, and also

the ordinary phosphate; no precipitate of phosphate of iron occurs.

A solution of sesquichloride of iron, after being mixed with a solution of citrate of ammonia, is likewise not precipitated by the ordinary phosphate of ammonia, or of soda; but the phosphate of potassa produces a precipitate immediately. If, however, a sufficient quantity of phosphate of ammonia had been previously added, the further addition of the potassa phosphate will not disturb the clear solution.

I inferred from these experiments that, not only pyrophosphate, but also the other phosphates of iron, will enter into a permanently clear solution with citrate of ammonia; in accordance with this inference, I prepared some ordinary phosphate of the sesquioxide of iron, and found it in its recent state entirely soluble in the ammoniacal citrate. It would appear, therefore, an easy matter for a physician to give phosphate of iron in solution by simply ordering citrate of iron and phosphate of ammonia, the solution, no doubt, will contain the citrate and phosphate of both bases.

My time being so much occupied, I have not had time to make any more experiments at present, and the few above related are not calculated to answer the question, whether or not a soluble double phosphate of ammonia and sesquioxide of iron may exist, or whether Robiquet's syrup of pyrophosphate of iron is merely a solution of an insoluble phosphate in citrate of ammonia.

I remain yours, very respectfully,

J. M. MAISCH.

[NOTE.—The employment of citrate of ammonia as a solvent for pyrophosphate of iron, originated, we believe, with M. Robiquet, who suggested it as a better agent than the pyrophosphate of soda for that purpose; and at pages 401–4 of this Journal for 1857, his process will be found noticed. Subsequently, (January, 1858,) J. G. Richardson, of Philadelphia, in a new process for Compound Syrup of the Phosphates, uses citrate of ammonia as a solvent for pyrophosphate of iron, which he introduces into that preparation in lieu of the ordinary phosphate, and at the same time effects the solution of the phosphate of lime by *free citric acid*. Joseph Roberts, of Baltimore, (see Maryland Journal of Pharmacy, March 4th, 1858,) suggests

a syrup in which acid phosphate of ammonia is the solvent of phosphate of iron, and which he considers a permanent preparation. In Mr. Maisch's letter a step further is taken; he ascertains that citrate of ammonia will dissolve and retain the ordinary phosphate of iron in solution, and that in presence of citrate of ammonia the oxide of iron cannot be precipitated from the sesquichloride of iron in solution. The latter observation has been made before by Rose, (see Gmelin's Hand. xi. 447,) so far as citric acid in a free state is concerned.

In a paper, which has reached us since the above was written, by Mr. A. F. Haselden, on names in connection with Pharmacopœial usage, (Pharmaceutical Journal, August, 1859,) we find the following; alluding to "syrup of phosphate of iron, sometimes called syrup of superphosphate of iron, and sometimes syrup of phosphate of iron, I have no doubt that generally the same preparation is looked for; but in the first, if prepared as the name would imply, an opaque syrup of an insoluble compound is the result; in the last two, an excess of acid to the phosphate enables the operator to produce a clear preparation, but this is uncertain in its strength and unstable in its nature. In order to meet this difficulty, the General Apothecaries' Company have introduced a preparation by the assistance or addition of *citrate of ammonia to the phosphate of iron*, and thus a preparation in scales is obtained like the ammonio-citrate of iron, which still sails under the name of the *pyrophosphate* of iron, and with which a light brown or dark straw colored syrup is prepared, bearing the title of syrup of pyrophosphate of iron."

From this it appears that Mr. Maisch is anticipated in regard to citrate of ammonia dissolving phosphate of iron. By trial we have ascertained that citric acid in a free state is a perfect solvent for recently precipitated phosphate of iron, and the addition of an alkali afterwards does not precipitate the phosphate. This naturally suggested a trial with the blue commercial ferroso-ferric phosphate. When equal parts of citric acid and of this blue phosphate are triturated with four parts of water and allowed to stand several hours with occasional agitation, the blue color gradually disappears, the phosphate is dissolved, and forms a greenish brown solution, which on dilution is not precipitated, nor does ammonia or potash throw down

the phosphate, which would indicate the formation of a double salt.

As suggested by Mr. Maisch, these facts render the prescribing of phosphate of iron in solution extremely simple, and physicians can extemporaneously vary the proportion of the phosphate to suit their views of particular cases, as a few examples will explain, viz :

Take of Phosphate of soda,	. . .	ʒiij.
Sulphate of iron,	. . .	ʒiiss.
Citric acid in powder,	. . .	ʒj.
Lemon syrup,		
Water, of each,	. . .	fʒiij.

Mix the syrup with the water, dissolve the phosphate in one half, the sulphate in the other half, mix them and add the citric acid.

The resulting mixture is a transparent thin syrupy liquid, not very unpleasant to the taste. Each fluid ounce contains about 12 grains of protophosphate of iron and a little sulphate of soda. The dose may be either a dessertspoonful or a tablespoonful, (3 or 6 grains), as the case may require.

Or the sulphate of soda may be avoided thus :

Take of (Vallet's) protocarbonate of iron,	. . .	ʒiiss.
Citric acid,	. . .	ʒiiss.
Phosphate of soda,	. . .	ʒiij.
Lemon (or other syrup)		
Water, of each,	. . .	fʒiij.

Triturate the carbonate of iron with half the water and the citric acid, till dissolved, add the syrup and lastly the remainder of the water in which the phosphate of soda has been dissolved.

The resulting liquid is a solution of phosphate of iron and citrate of soda, containing about three grains of the iron salt to the dessertspoonful.

A *syrup of proto-phosphate of iron* may be made by dissolving five drachms of sulphate of iron, and six drachms of phosphate of soda, severally in hot sweetened water, mixing the solutions, washing the precipitate with warm sweetened water on a cloth filter, expressing carefully and forcibly, and dissolving the moist mass with two drachms of citric acid, and sufficient water to make the whole measure two fluid ounces. To this add

six fluid ounces of simple syrup, mix and filter if necessary. Each teaspoonful will contain three grains of phosphate of iron. It is probable that the addition of sufficient ammonia to the solution to convert the citric acid nearly all into a citrate of that base; would render the syrup more permanent, but less agreeable, and by evaporating this solution, without adding sugar, to a syrupy consistence, it is quite probable that the soluble phosphate, in scales above alluded to, may be prepared.

The formula for "*Chemical Food*," or Compound Syrup of the Phosphates, may also no doubt be modified by substituting citric for phosphoric acid as a solvent for the phosphate of iron, as it has already for that of lime.—EDITOR AMER. JOUR. PHARMACY.

GLEANINGS FROM THE FRENCH JOURNALS.

BY THE EDITOR.

Researches on the Essential Oil of Valerian.—M. PIERLOT, (Répertoire de Pharmacie, Juin, 1859,) finds as the result of his researches: 1st. Essential oil of valerian pre-exists in the recent root of valerian. 2d. Recent or old, this oil contains five per cent. of valerianic acid. 3d. Rectified on caustic potassa it is perfectly neutral, and no agent has power to generate the acid from it. 4th. It contains two different essential oils; one a hydrocarbon ($C^{20}H^{16}$) which is neutral and volatilizes entirely without leaving a residue, and constitutes 28 per cent. of the crude oil. The other, oxygenated oil or valerol ($C^{24}H^{20}O^2$), is neutral, resinifies in the air and under the influence of nitric acid, and decomposes into several bodies. 5th. Valerol is constituted of stearoptene of valerian, resin and water; and lastly, that valerol cannot be acidified by any process whatever.

Purgative and Vermifuge Biscuits.—M. Fabre, of D'Arles, recommends the following biscuits for medicinal use, viz: To medicate each biscuit add for:

No. 1. *For children between 5 and 10 years old.*

Precipitated sulphur, pure resin of jalap, and pure resin of scammony, of each a grain and a half.

No. 2. *For children from 10 to 15 years old.*

Precipitated sulphur 4 grs., resin of jalap and resin of scammony of each 3 grains.

No. 3. *For adults.*

Precipitated sulphur 8 grains, resin of jalap and resin of scammony of each 5 grs.

The powders are well mixed in the paste of the biscuit and baked in an oven, increasing the quantities to suit the number of biscuits to be made.

*Oil of Ground Nuts, (Arachis hypogea).—*According to M. Perrins, editor of the *Jour. de Pharm. de Bordeaux*, ground-nut oil may be used instead of olive oil for preparing leadplaster and medicated oils. It has the advantage of costing less than olive oil, and is less disposed to become rancid. [The ground-nut oil in use in Philadelphia has too much odor to replace olive oil for many purposes.—EDITOR.]

Formation of Cyanide of Potassium in smoking Cigarettes of Belladonna and other Solanææ.—M. Marchand, of St. Germain, (*Répertoire de Pharmacie*, Mai, 1850), states that cyanide of potassium is formed during the combustion of medicinal segars from the nitrogenous products of the alkaloid with the potassa of the nitrate of potassa found in them, and that cyanogen may be detected by drawing the smoke through a solution of potassa and testing with a persalt of iron.

Oily Solution of Oleate of Binoxide of Mercury.—Prof. Jannel, of Bordeaux, gives the following formula for making this mercurial preparation :

Take of Pulverized red oxide of mercury 10 parts.

Crude oleic acid	100	"
Sweet oil of almonds	200	"
Distilled water	300	"

Introduce the whole into a flask, heat to 104° Fahr., during 48 hours, agitating from time to time. The oxide of mercury being dissolved, throw the contents of the flask on a filter; the water passes rapidly, and after the paper has dried, the oily solution slowly passes through, requiring about three days for 9 ounces. The solution is limpid, amber colored, viscid, odor analogous to oleic acid, and taste at first sweet but very disagreeable afterwards. It keeps well unless exposed to the direct solar rays, when the oxide of mercury is reduced and metallic mercury precipitated. It is used both internally and externally (*Rép. de Pharm. Mai, 1859.*)

Roman Chamomile.—M. Trimbal Lagrave, of Toulouse, (*Rép. de Pharm. Avril*, 1859) states that he has found this drug in French commerce adulterated with the flowers of *Crysanthemum parthenium*, Pers., and those of *Matricara parthenoides*, Derf.

Elixir of Citro-Lactate of Iron.—M. Robineaud, (*Jour. de Pharmacie*,) gives the following recipe for this preparation ;

Take of Citrate of the protoxide of iron, half a drachm.

Lactate of the protoxide of iron, half a drachm.

Distilled water, nineteen fluid drachms.

Alcohol (80 p. ct.) fourteen fluid drachms.

Simple syrup, twenty fluid drachms.

Tincture of lemon peel,

Tincture of cinnamon, each half a fluid drachm.

Tincture of cloves, six drops.

Caramel, q. s.

Put the lactate of iron in powder in a capsule with the distilled water, heat gently till dissolved, add the proto-citrate of iron, which dissolves promptly, filter the solution into a bottle containing previously the syrup and alcohol, and lastly, add the tinctures and caramel.

On the Essence of Scurvy Grass, (*Cochlearia officinalis*) by M. Geiseler, (*Arch. der Pharm. and Jour. de Pharm. July*, 1859.) The leaves of scurvy grass contain of organic matter 6.23 per cent, ashes 1.57 per cent ; and of water 92.19 per cent. The essential oil which these leaves afford by distillation with water does not pre-exist in the plant, but is produced under the influence of water and a peculiar ferment. According to M. Simons the dried leaves do not afford the oil unless bruised white mustard seeds are admixed with them to furnish the ferment. The younger leaves afford more oil than the old, about 1-5000th. The seeds of the plant also yield the oil.

Essence of scurvy grass has heretofore been considered to be identical with oil of mustard, but M. Geiseler finds it to be C^6H^6O,S ; that is to say, oil of garlic plus one atom of oxygen.

Essence of scurvy grass is very volatile, its odor recalls at the same time ether and horseradish, its density is 0.942, slightly soluble in water and very soluble in alcohol.

Mixed with six or eight times, its volume of concentrated

solution of ammonia, it yields crystals which are fusible above 212° F. and have the composition C^6H^5OS, NH^3 corresponding to thiosinnamin from oil of mustard.

On the Constitution of Solania.—M. Otto Gmelin (*Annal. der Chemie und Pharm. and Jour. de Pharm. July, 1859*), says, contrary to the received record, that solanin *does not contain nitrogen*, but is one of the glucosides, yields by the action of dilute acid solanidin and glucose, as observed by Zwenger and Kind. 100 parts of solanin yield 65.3 of glucose. The result following these facts is that solanin is not an organic base as heretofore considered.

DETERMINATION OF TALLOW OR STEARIC ACID IN WAX.

By E. GEITH.

The author considers that the detection of the adulteration of wax with tallow or stearic acid, can only be effected by an agent capable of separating the adulterating substances from the wax. After numerous experiments, he found in carbonate of soda a substance possessing this power. This salt, dissolved in water, and employed in excess, is able to saponify the tallow, and, consequently, also to combine with the stearic acid. The wax, however, is, under certain conditions, not at all, or only very slightly effected by it. But if pure white or yellow wax be boiled in a porcelain capsule, with an equal weight of carbonate of soda, and six times its weight of distilled water, and at the same time constantly stirred with a glass rod, until the bottom of the capsule begins to be coated with carbonate of soda, a not inconsiderable part, even of the purest wax, will become saponified. Whilst the mass is still hot, about six times its weight of alcohol, of eighty per cent., are to be added, and the whole rubbed down with a pestle, adding at the same time, gradually, about sixteen or eighteen parts of alcohol, of fifty per cent., until the undissolved parts are seen floating in the liquid, in a finely-divided state. The mixture is then to be placed on a filter. On the addition of excess of an acid to the filtered liquid, we obtain a rather abundant white or yellow precipitate. This clearly proves that the wax contains a substance which is easily saponified by carbonate of soda. It was there-

fore, necessary to discover some means by which this saponifiable substance might be separated from those parts of the wax which can not be saponified by carbonate of soda, and at the same time, also, from the tallow and stearic acid. I found that alcohol answers this purpose; *it dissolves this saponifiable substance in great quantity*, whilst the dissolved proportions of tallow and of stearic acid, and of the not saponifiable wax, are but very inconsiderable.

In order, therefore, to detect an adulteration of wax, we must first examine whether it be adulterated with stearic acid. For this purpose, we put into a retort about two drachms of the wax, and pour over it *one ounce* of limewater, and *one ounce* of distilled water, and boil for some time. *If the wax does actually contain stearic acid, the liquid completely loses every trace of alkaline reaction.* This fact has already been mentioned by others, but with the addition that the liquid throws down a precipitate of stearate of lime. I must, however, contradict this observation, for, notwithstanding repeated experiments which I have made, I was not able to discover anything of the kind. I found, moreover, that even turbid lime water became clear, whether boiled with pure wax, or with wax adulterated with either tallow or stearic acid, but it did not lose its alkaline reaction in the two first cases. Lime water furnishes us, therefore, with an excellent test of the presence of stearic acid in wax. It is also useful in determining the quantity of stearic acid present; for the more lime-water of constantly equal strength is deprived of its alkaline reaction, by a given quantity of wax, adulterated with stearic acid, the more of the latter must the wax contain.

No stearic acid having been detected, the wax remains yet to be tested for tallow, which is done in the following way:

One dram of wax is put with two ounces of alcohol, of eighty per cent., in a retort, boiled for a few seconds, and the whole quickly poured into another vessel, which contains one ounce of cold alcohol of eighty per cent. The retort is to be washed out with another ounce of boiling alcohol. After several hours, when quite cold, the mixture is filtered, and two ounces more alcohol, of eighty per cent., poured on the residue. After all the alcohol has passed through the filter, the latter is wrapped

up in a few sheets of filtering paper, and pressed between two bricks until it no longer appears moist. The wax is now placed in a porcelain capsule, with one dram of carbonate of soda and six drams of distilled water, and boiled until the bottom of the cup begins to be covered with carbonate of soda, constantly stirring it with a glass rod. One ounce of alcohol, of eighty per cent., is then to be added to the hot mass, and the whole rubbed down with a pestle, until the undissolved parts form a fine powder; while, at the same time, a few ounces of alcohol, of fifty per cent., are gradually added. When cold, the whole quantity is carefully filtered and washed with alcohol, of fifty per cent., as long as the filtered liquid is rendered turbid, by a solution of neutral acetate of lead with acetic acid.

The whole filtered liquid is now to be reduced by evaporation in a porcelain capsule to one ounce, and when perfectly cold, again filtered, and the residue washed with water mixed with alcohol, as long as the washings are rendered turbid by a solution of acetate of lead, acidified by acetic acid.

Having thus obtained about two ounces of liquid, it is to be poured into a medicine bottle, and well shaken; if the wax was pure, a slight froth will form, but will disappear after a few minutes; if, however, it was adulterated, with, even only to the extent of from two to four per cent., tallow or stearic acid, a very abundant froth forms itself, which does not disappear until after half or one hour.

Another test may now be made, by adding to the liquid in the bottle an excess of acetic acid. If the wax was pure, the liquid will, at the most, become scarcely perceptibly opalescent, but not distinctly turbid. If it contains, however, tallow or stearic acid, a more or less abundant flakey precipitate will be formed after a short time, particularly if the bottle be shaken. Gradually these flakes rise to the surface of the liquid. If it is desired to determine the quantity of tallow or stearic acid present, the liquid is not to be mixed with acetic acid, but is to be treated in the following manner: Add to it a solution of acetate of lead as long as a precipitate falls down, then add acetic acid until the liquid acquires a distinct acid reaction. The precipitate is to be allowed to fall down, for several hours, then placed on a filter, weighed, dried in a temperature of 212° Fahr., and washed

with *cold* distilled water, as long as the washings become brown, by the addition of sulphuretted hydrogen water. Then place the residue in a small porcelain capsule, and weigh it again, after having perfectly dried it in a temperature of 212° Fahr.

If the wax is pure, one dram of the original precipitate will have been reduced to one-half two-thirds grain. If ten per cent. of tallow were mixed with it, the precipitate will now weigh two to two-and-half grains. If twenty per cent. tallow, it will be three three-fourths to four one-fourth grains.

Unfortunately, the quantity of the precipitate is not constant, even with the utmost care. The quantitative adulteration of wax by stearic acid is more easily detected; for one dram of wax, adulterated with five per cent. of stearic acid, gives, when treated in the above manner, 2 to 2½ grains of precipitate; with ten per cent., 4 to 4½ grains; with twenty per cent., eight to nine grains. The yellow wax does not materially differ in this respect from white wax, and its adulteration can be detected in the same way.

POSTSCRIPT BY DR. BUCHNER.

The author of the foregoing prize essay has accompanied his *brochure* with ten samples of wax.—1, perfectly pure white wax; 2, white wax adulterated with two and-a-half, five, ten, twenty, thirty and fifty per cent. stearic acid; 3, white wax adulterated with five, ten and twenty per cent. of tallow. The judges have come to the conviction that these adulterations could only approximately be discovered by an exact comparison of the *melting degree*, and of the *specific weight*, if the *chemical test* of Mr. Geith was not made use of. The sensible properties, smell, color, brilliancy, transparency, softness, toughness, fracture and texture, are not safe indications for an adulteration, and although wax, mixed with equal proportions of stearic acid, is, in a cold state, considerable more brittle and less soft and pliable than pure wax, still this difference is, in an adulteration with twenty to thirty per cent. of tallow or stearic acid, not great enough, as to discover with certainty the degree of adulteration.

M. Lepage, of Gisors, has compared the different melting points of pure bees-wax and of tallow, and also of given mix-

tures of these two substances, and has found that it is possible, by means of this physical test, to discover with certainty the purity or adulteration of wax. M. Legrip, of Chambon, has closely examined this wax test of Lepage, and found it perfectly correct and safe, as far as no great exactness with regard to the quantity of the admixed tallow is required.* This method has this advantage—that it is easily performed, not expensive, and causes no great waste of wax. It is done in the following manner :

In a quantity of melted wax the bulb of a thermometer is immersed, so that it is covered with a moderately thick coat of wax, and when perfectly cold, the thermometer is fastened with a cork into a retort with a long neck, so that the bulb of the thermometer is suspended in the body of the retort. The latter is then placed in a vessel filled with water, which is slowly heated over a moderate fire, the globe and the scale being closely watched. As soon as the wax begins to melt and to drip off, the degree of temperature is marked down and composed with the following scale, given by Lepage and Legrip :

Pure tallow melts at.....	46° C.
A mixture of 19 parts of tallow, and 1 of white wax, at.....	47.0 C.
“ 7 “ “ 1 “	49.5 C.
“ 5 “ “ 1 “	52.5 C.
“ 3 “ “ 1 “	55.5 C.
“ 1 “ “ 1 “	59.0 C.
“ 1 “ “ 3 “	60.5 C.
“ 1 “ “ 5 “	61.5 C.
“ 1 “ “ 7 “	62.5 C.
“ 1 “ “ 11 “	63.0 C.
“ 1 “ “ 19 “	64.0 C.
Pure white wax.....	64.0 C.
Pure yellow wax.....	64.0 C.

The difference between the melting point of wax and that of tallow is, therefore, 18°, which gives sufficient scope for comparison ; still the melting point of a mixture of given parts of wax and tallow, cannot be determined by calculation, if the melting points of wax and tallow alone are given ; for, according to theory, a mixture of fifty parts of wax and fifty parts of tallow, should melt at 55° C. as $\frac{46+64}{2} = 55$, but experimentally it was found to be at 59° C ; we must, moreover, observe here,

*Jour. de. Chim. Med., 1845, p. 34.

that the melting points found by Legrip do not quite agree with those given by Lepage.

M. Legrip is, therefore, of opinion, that a more correct cereometer could be obtained by comparing the *specific weights* of wax and tallow. He found the specific weight of *the white and yellow wax* to be $=0.962$, and that of *tallow* $=0.881$. If, however, these data be compared with those given by other experimenters, we find also here considerable discrepancies; for, according to Muschenbrock and Brisson, the specific weight of the yellow wax is $0.960-0.964$, and that of white wax, $0.966-0.968$. The specific weight of sheep tallow Mushenbrock found to be $=0.943$, and Brisson, $=0.923$. That of bullocks' tallow is after M. $=0.955$, and after B. $=0.923$, consequently much greater than Legrip has found it.

The principles of Legrip's cereometer is, however, notwithstanding these differences, correct and worthy of notice; it is this—alcohol, of a given specific weight, is diluted with so much water, that the wax placed in it at a temperature of 15° C. neither sinks nor swims on the surface of the fluid, but keeps in the middle of the same; it is, then, only necessary to employ the areometer, in order to determine from the specific weight of the alcohol, the purity or the degree of adulteration of the wax. Assuming the specific weight of the wax to be $=0.962$, its purity is established, if it keeps in the midst of alcohol of this specific weight, or of 29° by Gay Lussac's areometer, whilst a specific weight of 0.881 or 46° after Gay Lussac, indicates the pure tallow. A mixture of these two standard fluids, taken at equal parts, represents a mixture of equal proportions of weight of wax and tallow, and corresponds with $37^{\circ}.5$ on Gay Lussac's areometer:

33°.3	G. L. areometer	=75	wax	and	25	tallow.
37°.5	"	=50	"	"	50	"
41°.7	"	=25	"	"	75	"
46°.0	"	= 0	"	"	100	"

The Druggist.

THE LEAVES OF WILD CHERRY. (*CERASUS SEROTINA*.)

BY WILLIAM PROCTER, JR.

The poisonous nature of the leaves of the wild cherry tree has long been known. Dr. Coxe, in his Dispensatory, (edition 1806,) says, "The distilled water of the leaves is a powerful poison to different animals, which *seems* dependent on the presence of the same principles which exist in peach kernels, &c., lately shown to be prussic acid." It is usual to import the "Aqua Lauro-cerasi" of the foreign Pharmacopœias to meet the demand of physicians for this form of hydrocyanic acid. It is believed that the distilled water of the leaves of wild cherry may be substituted for it with perfect reliability and equal uniformity. The question has been asked, whence comes the volatile oil and prussic acid of the cherry laurel leaves? Does amygdalin exist in them? Liebig was not able to detect amygdalin in the cherry laurel leaf. He believes that the oil is secreted in the leaf, like other volatile oils, ready formed, but probably derived from pre-existing amygdalin in the circulation of the plant. This view is rendered probable by experiments in the paper on amygdalin, before quoted, in which the presence of amygdalin in small quantity was detected in the alcoholic extract of dried wild cherry leaves. To ascertain the hydrocyanic acid value of the leaves, 1,000 grains, recently gathered, were cut and bruised quickly, put in a bottle, with twelve fluid ounces of water, macerated twenty-four hours, and distilled till three fluid ounces had passed over. The first ounce was quite milky, the volatile oil in suspension soon separating from it, and collecting in globules at the bottom of the receiver. The greater part of the oil and the acid were in this portion, because, when the other two ounces of water had distilled, they re-dissolved the oil, and retained it in solution. 1,000 grains of this distilled water, when treated with a weak solution of nitrate of silver, afforded 3.25 grains of cyanide of silver, indicating 0.65 grains of anhydrous hydrocyanic acid in that quantity of the distilled water. It is believed, that if the quantity of distilled water was made equal in weight to the leaves distilled, that the strength of the water would amount to one-tenth of one per cent, which is that of the best cherry laurel water.

M. Cap found that cherry laurel leaves, between the 15th of June and the 15th of August were very uniform in composition, and that the distilled water made during that season was reliable, if the process was conducted with the requisite care. M. Deschamps determined that water distilled from the unbruised leaves after twenty-eight hours' maceration, contained thirty-five per cent less hydrocyanic acid than that from the same leaves, after they were properly bruised. He is also of the opinion that about five drops of sulphuric acid added to each pint of cherry laurel water very much increases its permanence.

As the wild cherry grows in all section of the Union, it will afford to the country physicians a source of hydrocyanic acid easily attainable, and as reliable as cherry laurel water.—*Proc. Amer. Pharm. Assoc.* 1858.

ON THE POISONOUS PROPERTIES OF THE ETHEREAL OIL OF ELEMI.

BY DR. EMIL MANNKOFF.

The ethereal oil of elemi is obtained from the resin of elemi, brought from Brazil and Yucatan. It is found in the resin in very valuable proportions, but on the average it may be considered to exist in the quantity of about six per cent. The oil is transparent, almost colorless, having a smell which is not unpleasant, and a somewhat acrid and bitter taste. It is insoluble in water, but is easily dissolved in alcohol or ether. According to Stenhouse and Deville, the analysis of the oil of elemi gave the formula of $C^5 H^8$.

Dr. Mannkoff made a series of experiments on rabbits and frogs, with a view of ascertaining the operation of the oil upon the animal economy. In the case of the rabbits, the oil was injected into the stomach by means of an elastic catheter; in frogs the same operation was partially resorted to, but in some the oil was injected under the skin of the back. In a few cases the oil was applied locally on particular parts of the frogs.

The conclusions drawn by Dr. Mannkoff as to the operation of the oil of elemi on animals are the following: namely, that when applied to the intestinal tract, it produces hæmorrhagic

erosions and numerous functional disturbances in the stomach; and in the intestines, increased peristaltic action and sensation of pain, succeeded by paralysis and anæsthesia. The oil acts in a similar manner wherever it is applied directly. After absorption it paralyzes the sensitive portion of the nervous system and the nervus vagus. Hence arise,— 1. Acceleration and increased strength of the movements of the heart, and consequently increased diuresis, which is connected with an inflammation of the kidneys to a greater or less extent, and perhaps of the bladder, produced by a specific irritation of the poison; and there is afterwards a sensation of thirst. 2. The diminution and gradual suppression of the respiration occasioned by atelectasis and emptying of the lungs, and diminution of temperature, with which deficient nutrition is associated as a cause. In the second place, when paralysis of the heart is at last produced, death ensues, probably due to the abolition of the functions of the brain.

In concluding his paper, Dr. Mannkoff introduces the question as to the use which may be made of the ethereal oil of elemi as an internal remedy. In this point of view three circumstances ought to be taken into consideration. 1. The increase of the heart's contractions. 2. The increase of diuresis. 3. The anæsthetic effects on the sensitive nerves. The oil might probably be given in the cases in which oil of turpentine is found useful, for both oils coincide very much in their medicinal properties. Perhaps the oil of elemi might be preferable from its less unpleasant taste. The question may be asked whether the oil of elemi might not cause inflammation of the kidneys when given in a sufficient dose; but this point can only be determined by experiments on the living subject. Still, since oil of turpentine produces a decided effect in neuralgia, as is proved by the operation of this oil on the sensitive nerves, Dr. Mannkoff believes that experiments with oil of elemi in similar cases would be completely justified.—*Brit. and For Med. Rev. from Virchow's Archiv für Path. Anat. und Phys. und für Klinische Med.* 1859.

PROCESS FOR ASCERTAINING THE PROPORTION OF QUININE
IN CINCHONA BARK.

This process, published by M. Guillermond in the 'Gazette Médicale' of Lyons, is a modification of one already published by the same writer in 1847. The following is the process: Take twenty grammes of yellow bark, powder it without leaving any residue, and pour upon the powder alcohol at 76°, in sufficient quantity to form a soft paste, which is to be heated for a few minutes until the fibre is thoroughly penetrated by the liquid; then introduce into the paste ten grammes of hydrated lime in fine powder: mix thoroughly, so as to form a homogeneous mass, which is to be heated on a plate until all humidity is completely eliminated. This powder is afterwards to be treated with 100 grammes of rectified sulphuric ether, which will dissolve and remove all the quinine. This ether is then to be rapidly evaporated at the heat of boiling water, and the residue will contain only the quinine and a small proportion of a yellow coloring matter, which may be neglected. In order to determine the quantity of quinine obtained, either of the three following methods may be adopted:

1. Dry completely the ethereal residue. Its weight will give that of the quinine, plus the portion of coloring matter, the quantity of which is insignificant.
2. Dissolve the residue in a little alcohol and acidulate it with very dilute sulphuric acid, the saturating power of which for quinine is ascertained. For this purpose a graduated tube may be employed, so that a given quantity of the dilute acid corresponds to one gramme of quinine.
3. Weigh the sulphate of quinine which is obtained. It may be dried in a few moments by exposing it to the sun or to the heat of a stove.

This process, according to M. Guillermond, is recommended by its simplicity, and the celerity with which the result is obtained, for only about three hours are required in the operation: and the plan possesses the additional advantage of separating completely the whole of the alkaloid.—*Brit. and For. Med. Rev. from Bull. Gen. de Ther. Oct. 30th, 1858.*

QUANTITATIVE DETERMINATION OF THE AMOUNT OF TANNIN IN TANNING MATERIALS.

BY GUSTAV MÜLLER.

The precipitant employed by the author for the determination of the tannin in fluids is a solution of gelatin, which has already been made use of for the same purpose; but the author has convinced himself by numerous experiments, that an accurate determination of tannin by means of solution of gelatin cannot be made directly, inasmuch as the yellowish-brown precipitate of gelatin containing tannin, or tannate of gelatin, thus produced, is never so completely separated from the solution that the supernatant fluid remains perfectly clear, which, however, must be the case if the precipitation of the tannin by solution of gelatin be adopted for the quantitative determination of the tannin in fluids.

After many trials, the author found that the addition of a small quantity of alum to the solution of gelatin furnished a suitable means to enable tannin to be precipitated without any difficulty from any fluids containing it, so that it might be determined with the greatest exactitude; the separation of the precipitate (tannate) takes place so rapidly and completely that in the course of a few minutes the fluid over the precipitate appears quite limpid, and consequently may be immediately tested for any possible residue of tannin. For this purpose, according to the author, the best plan is to employ two watch-glasses, placed upon a black ground to enable the reaction to be detected with more ease; a few drops of the fluid standing over the precipitate are taken up with a little stick and dropped into each watch-glass, and then into one glass two drops of the aluminous solution of gelatin, and into the other a drop of solution of tannin or decoction of galls; a distinct rod should be used for each test-fluid in order to avoid mistakes. In this way, by the turbidity produced, we may detect on the one hand the smallest quantities of tannin, and on the other, the smallest traces of gelatin, in case the quantity necessary for precipitation should have been exceeded. To avoid the latter occurrence, the solution of gelatin is only dropped into the solution of tannin un-

der examination, but this is continued uninterruptedly until on the falling of a drop upon the surface, the characteristic ring of tannate of gelatin is no more to be detected. When this moment occurs, it is necessary that the precipitation should be interrupted for a time, and that the fluid, which appears limpid after a lapse of a few minutes, should be tested for tannin. The little trouble attending this operation should not prevent its being done frequently, in order that no more of the aluminous solution of gelatin may be employed than is just necessary for the precipitation of the tannin, as the amount of the latter is finally calculated from that of the gelatin.

In order to ascertain how much aluminous solution of gelatin represents a given quantity of pure tannin, 5 grs. of the latter were dissolved in half an ounce of distilled water, and precipitated with the greatest care. After repeating the experiment five times, the author found that 155 grs. of the solution of gelatin were required for this purpose. Consequently a decoction of $\frac{1}{4}$ ounce of oak-bark, if 1 ounce (=480 grs.) of aluminous solution of gelatin were employed in its precipitation, would have contained $15 \frac{15}{31}$ grs. of tannin, in accordance with the formula

$$155 : 5 :: 480 ; 15 \frac{15}{31}$$

The quantity of solution of gelatin employed for the determination of tannin is ascertained by accurately weighing a 3 or 4 ounce glass filled with it, and ascertaining the difference of weight after the precipitation; this difference of course indicates the quantity of solution of gelatin employed.

For the preparation of the aluminous solution of gelatin, 4 ounces of distilled water are weighed in a phial; into this 1 drachm of ordinary clean joiner's glue, crushed a little, is put, when the glass, surrounded with paper, is placed in a vessel of water, and set upon the fire. When the glue is dissolved, which takes place without any residue when the so-called Russian glue is made use of, 15 grs. of pure powdered alum are added to the hot fluid, which is then shaken round several times, and may be kept, well-stoppered, in a dark place.

The substances (about 50—100 grs.), the amount of tannin in which is to be ascertained, are to be extracted for a few minutes with as much distilled water as will cover them; and this

process must be repeated from four to six times, with constant stirring, so as to exhaust them as much as possible. The decoctions are poured off each time, without straining; the fluids, to which the residue is finally added, are collected in a beaker, but the determination of the tannin must not be proceeded with until they are cold. In dropping in the cold solution of gelatin, a small rod must be employed to prevent it from flowing out in a stream, by which, especially towards the close of the experiment, the precipitation might easily be exceeded. It is also well to allow the exhausted residue to remain in the fluid, as it assists greatly in the rapid separation of the tannate of gelatin.

The determinations effected by the author in the way above described gave the following results:—

	Grains of Tannin.
100 grs. of young oak bark,	13 $\frac{27}{31}$
“ “ of oak bark from a tree 100 years old	8 $\frac{14}{31}$
“ “ Eschurg oak-bark	19 $\frac{11}{31}$
“ “ Pine-bark from young stems	12 $\frac{28}{31}$
“ “ of native galls	50 $\frac{1}{2}$
“ “ of Divi divi	49 $\frac{8}{31}$
“ “ of Sumach	19 $\frac{11}{31}$
“ “ of Tormentilla root	33 $\frac{12}{31}$
“ “ of American bark (the so-called Mimosa-bark, probably belonging to a cinchonaceous plant)	31 $\frac{5}{31}$
“ “ of best gall-nuts	77 $\frac{13}{31}$
“ “ of Chinese galls (from <i>Rhus semi-alatum</i>)	65 $\frac{26}{34}$

Chem. Gaz. from Elsner's *Technisch-chemische Mittheilungen* für 1857–1858, p. 45; *Polytechn. Centralblatt*, 1859, p. 56.

INTRODUCTION OF CINCHONA INTO INDIA.

We have great satisfaction in stating that steps have been taken for the realization of this important project, for we understand that Mr. Clement Markham has been appointed by the Government to proceed to the Cinchona districts of South America for the purpose of obtaining seeds and plants of some of the more valuable species of Cinchona, and of transporting

them to India, where there is good reason to hope their acclimatization will be as successful as it has already been in Java. We are glad to hear that Mr. Markham is well acquainted with the Cinchona districts, and has a thorough knowledge of the Spanish language. Such qualifications, when accompanied by good botanical acquirements, can scarcely fail to achieve success in so important an undertaking, and we sincerely trust that all who are in any position to assist Mr. Markham will do so cheerfully, and then we have little doubt the experiment will be entirely successful.

We take this opportunity of correcting an error which many Pharmaceutical Chemists and others have fallen into, with reference to the supposed discovery of a species of Cinchona in Africa by Dr. Livingstone. The plant thus thought to be a Cinchona is a species of *Malouetia*, Nat. Ord. *Apocynaceæ*. This plant, like several others of the order to which it belongs, possesses febrifugal properties, but it contains no quinine or other alkaloid resembling it, as supposed by Livingstone.—*Pharm. Journ.*, London, July 1, 1859.

ON A NEW SOURCE OF AMMONIA.

Mr. Alexander Williams, of Neath, in a letter to the *Journal of the Society of Arts*, has suggested a means of economizing the waste nitrogen products escaping from the oil of vitriol chamber, by effecting their conversion into ammonia. This is done by passing the escaping gasses, mixed with steam, over heated charcoal, and then into dilute sulphuric acid, by which sulphate of ammonia is obtained.

The following is Mr. Williams's description of the arrangement he employs, and which has been tried on a large scale at the Pontardawe Vitriol Works.

The apparatus fitted up was of the following description :—A furnace was built above the exit tube of one of the vitriol chambers, and a brick gas retort, about 14 inches in diameter, 8 feet long, and open at both ends, was passed through its whole length. This retort was filled with charcoal, and kept at a red heat; the exit tube of the chamber, and a steam-jet to supply

the hydrogen, were attached to one end, whilst to the other end was fixed an upright leaden cylinder, filled with coke, and moistened with diluted sulphuric acid. On passing the waste gases and steam through the retort containing red-hot charcoal, both were decomposed, the oxygen of each uniting with the charcoal to form carbonic acid; the nitrogen and hydrogen combining to form ammonia; then together, probably forming carbonate of ammonia, which was again decomposed by the diluted sulphuric acid, the sulphate of ammonia being found remaining in solution. This solution was then evaporated, and in July, 1857, I first had the pleasure of obtaining any quantity of crystals of sulphate of ammonia, by this process, from a vitriol chamber in actual work.

Mr. Williams does not intend to make this process the subject of a patent.—*Pharm. Journal*, July, 1859.

SAPONIFICATION OF FATTY BODIES BY MEANS OF CHLORIDE OF ZINC.

By LÉON KRAFFT and TESSIÉ DU MOTTAY.

The object of the authors' investigations was the discovery for some South American merchants of the means of transforming the fatty bodies of their countries into stearic acid, and afterwards into candles. The conveyance of sulphuric acid by sea was to be avoided, on account of its danger.

Struck by the great analogy of the action of sulphuric acid and chloride of zinc upon organic matters, they thought of applying the latter to the saponification of the neutral fatty bodies. Economically the idea was very feasible, as fused chloride of zinc may be obtained at Marseilles for 25 francs per 100 kilogrammes; when packed in cases or casks, it may be conveyed anywhere without inconvenience. The application remained to be realized.

When any neutral fatty body is heated with anhydrous chloride of zinc, the latter melts and disappears as the temperature rises. Between 302° and 392° F. the mixture of the two bodies is complete. If the temperature be then sustained for some time, and the product washed several times with hot water, or,

still better, with water acidulated by hydrochloric acid, a fatty body is obtained, which, when distilled, furnishes the corresponding fatty acids with an insignificant production of acroleine. The washing-waters carry off nearly all the chloride of zinc employed, which can be again prepared for use by evaporation. The fatty acids are thus produced in as great quantity as by the ordinary methods; they have the same aspect, qualities and melting-point as those produced in manufactories where the distillation is effected after the sulphuric saponification. To operate well and quickly, the mixture of the neutral fatty body and chloride of zinc must be heated rapidly until the moment when, in consequence of the violent reaction of the two bodies upon each other, aqueous vapors are evolved in abundance.

The washing with acidulated water after saponification may be avoided, but then the products of the distillation are softer. If the distillation be hastened by means of a current of superheated steam, this defect may be corrected in a great degree. In all cases steam allows harder and less colored products to be obtained with rapidity. The quantity of chloride of zinc necessary for a good saponification varies from 8 to 12 per cent. of the weight of the neutral fatty body.

The following are some of the authors' experiments:—

TALLOW.—*Experiment 1.* 300 parts of tallow, fusible at 100° F. After saponification and washing 284; loss by saponification, 5 per cent. After distillation with steam, 250 parts of substance fusible at 113° F.; loss by distillation, 13 per cent.

Experiment 2. 2000 parts of fat fusible at 100° F., and 240 parts, or 12 per cent. of chloride of zinc. After saponification the fusing-point was 107°·6 F.; and after distillation, without steam, 113° F. Chloride of zinc recovered 215 parts.

PALM-OIL.—*Experiment 1.* 2160 parts of palm-butter fusible at 75° F., and 12 per cent., or 260 parts of chloride of zinc. The product of saponification was fusible at 95° F., and that of distillation (without steam) at 113° F. Chloride of zinc recovered, 211.

Experiment 2. Palm-butter. 195 of saponified product gave 175 of fatty body, fusible at 122° F.

Experiment 3. 300 of palm-oil; after saponification, 290;

loss, 3.3 per cent. 260 parts fractionally distilled with steam gave—

First product. . . 155 white crystallized, fusible at 131° F.
Second product. . 32 yellowish “ “ “ 91°-4 F.
Third product . . 55 greenish yellow, consistence of honey.

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COCOA-NUT OIL gave equally conclusive results. It requires a little more chloride of zinc, in consequence of the large quantity of water which it contains or produces.

OLEIC ACID.—300 parts of oleic acid from a candle factory where the lime saponification is practised, treated when hot with 12 per cent. of anhydrous chloride of zinc, furnished on distillation a solid white product weighing 170, and fusible at 89°.6 F., and a yellow product of butyraceous consistence weighing 60. This is a remarkable fact, and clearly shows the similarity of the action of chloride of zinc and sulphuric acid. By means of sulphuric acid, 25 to 30 per cent. of solid fatty matter is obtained by distillation from oleic acid produced in the manufactories of candles where lime-saponification is practised.—*London Chem. Gaz.* April 15, 1859, from *Comptes Rendus*, February 21, 1859.

ON THE PREPARATION OF METALLIC COBALT.

By WILLIAM SHARSWOOD.

The attention of the author was attracted to this subject owing to a necessity of obtaining the element for the purpose of making researches in thermo-electricity.

The source from which the author recommends the metal to be obtained is the chloride of purpureocobalt,* from the fact of its presenting the means by which a pure chloride of cobalt can be obtained with comparatively most ease and certainty.

The formation of the chloride of purpureocobalt is effected by simply oxidizing the chloride of cobalt with ammonia by exposure to the air.

It is not necessary to use a pure chloride of cobalt in forming

* Researches on the Ammonia-Cobalt Bases, by Walcott Gibbs and Fred. Aug. Genth, *Chemical Gazette*, vol. xv. p. 188.

the chloride of purpureocobalt; any commercial oxide answering, even in the presence of arsenic, nickel, iron, and other impurities.

A perfectly pure chloride of cobalt is easily prepared from this salt by heating it in a porcelain crucible until vapors of ammonia and chloride of ammonium cease to be driven off. The pure anhydrous chloride of cobalt thus obtained is characterized by beauty of color, forming pale blue talcose scales.

To obtain the metal in a state of sponge, it is merely necessary to reduce the chloride by means of hydrogen. In order to fuse the metal, it is an indispensable precaution, to preserve its purity, that it be effected by means of the *lime crucibles* as employed by M. Sainte-Claire Deville. In connection with these crucibles, he uses a lamp of peculiar construction, in which the vapor of any liquid hydrocarbon, as oil of turpentine, is completely consumed by means of an artificial blast of air. By means of this instrument the fusion of felspar can be accomplished with facility. It has been found that the platinum metals fused in *these crucibles*, present properties very different from those heretofore attributed to them, the lime serving to deprive them of osmium and silicon.

As much carbon becomes mixed with cobalt in the ordinary method of fusion, one of its characters, that of malleability, becomes entirely destroyed; and a piece of the metal thus prepared, when placed before the oxyhydrogen blowpipe, upon a brick, in which a groove had been cut for the purpose of obtaining it in the form of a bar, merely assumed an intumescent state, without exhibiting any tendency to enter the incision.

Since this, M. Debray has found that pure molybdenum completely withstands the temperature at which platinum, &c. become liquid; and that its melting-point, in a crucible of carbon before the oxyhydrogen blowpipe, is at a temperature at which rhodium fuses. He further states, however, that the fused mass was contaminated with from 4 to 5 per cent. of carbon.—*Lond. Chem. Gaz.*, June 15, 1859, from *Proc. Charleston Nat. Hist. Soc.*

ON OXIDE OF ZINC.

BY CHARLES CASPARI.

Hellot was the first who, in the year 1735, taught the preparation of the Oxide of Zinc by the pyro-chemical process; and formerly all the oxide used for pharmaceutical and medical purposes was prepared by the combustion of metallic zinc. It was this preparation which, in former years, acquired so high a reputation as a therapeutical agent, under the names of *Calx Zinci*, *Flores Zinci*, *Lana Philosophica*, *Pompholix*, *Oxidum Zinci*, *Nihilum Album*, etc. To prepare it in this manner, we expose metallic zinc to a red heat in a deep crucible, placed somewhat obliquely in a good blast furnace. The vapors, arising from the zinc, will absorb oxygen from the air, take fire, and burn with a splendid greenish-blue shining flame. The oxide, thus formed, covers partly the sides of the crucible and partly the molten metal, in the form of white flocks, which have to be removed, now and then, with an iron spoon, so as not to interrupt the oxidation of the zinc, and to allow a free access of air. To remove all particles of metal, the oxide, when cold, is washed frequently with water, passed through a sieve, and then dried. The metallic zinc ordinarily occurring in commerce is never entirely free from other metals, and when oxidized in the above manner, part of the contaminating metals are also oxidized and will be mixed with the oxide of zinc. However, by using the better qualities of the metal, these impurities are only trifling and seem not to have lessened its application for therapeutical purposes. Most of the oxide of zinc now in use is hydro-chemically prepared by precipitating a pure salt of zinc in such a manner as to decompose it either with carbonate of ammonia, or with carbonate of soda. The following mode of preparation seems to answer well all the demands required of it, both as to cheapness as well as the quality of the product thereby obtained.

Dissolve 17 ozs. of carbonate of soda in 6 pints of water; after filtration, heat the solution to the boiling point, and add to it, by degrees, continually stirring, a filtered solution of 16 ozs. pure sulphate of zinc in 3 pints of water. The precipitate thus obtained is not gelatinous, but more loose powder-like, and

is deposited, therefore, very quickly, and is also very easily washed out. To obtain a good precipitate, it is necessary to have the solution of soda heated to boiling, and then to add to it the solution of the sulphate of zinc. By mixing the solutions cold and by pouring the solution of soda into that of the zinc, a thick, gelatinous, bulky precipitate is produced, and it can not be avoided, that some sub-sulphate of zinc, or some other basic combination of sulphuric acid, is formed with the oxide; all, or any, of which can not so easily be washed out from the precipitate, on account of their difficult solubilities.

To avoid, therefore, these inconveniences, Schindler proposed to add the solution of zinc to that of soda, and not to mix until the latter is heated to the boiling point. The object of treating in this manner is perfectly attained, and the formation of a basic salt entirely prevented. Although equal parts of carbonate of soda and of sulphate of zinc will decompose each other, yet it is preferable to use a small excess of the carbonate of soda, to prevent, more completely, the formation of any basic salt.

The well washed and dried precipitate is then heated in a crucible, until diluted sulphuric acid no longer causes an effervescence; when a small quantity, after having cooled, is tested with it. The zinc losing its carbonic acid at much less than red heat, it is, consequently, unnecessary to employ so high a temperature; and Mohr, therefore, proposes to burn it in a glass matrass on an open coal fire, requiring only one-half the time and fuel in this way. For this purpose, the carbonate of zinc, triturated to fine powder, is put into a dry glass matrass and placed on an iron ring, or in a wire net, over a moderate coal fire. The carbonate of zinc, when heated, loses its water and carbonic acid, and appears, during their disengagement, as a liquid, apparently boiling in the centre.

The matrass is heated cautiously, shaking it now and then until all the carbonic acid has passed off, and a small quantity, taken out after cooling, no longer effervesces when brought in contact with acids.

The oxide will now appear like any other fine powder, adhering quite closely to the matrass. Small quantities can, by this method, be very readily prepared in a few minutes by heating them in a small matrass over a common spirit lamp. The same

result will be obtained by burning carbonate of zinc in a porcelain dish over a moderate coal fire. The burning in a glass matrass will be preferred, after some practice, over all other methods; giving the result in less time, less loss by dusting away, and no danger of the oxide being injured by dust and other impurities. Whenever carbonate of zinc is edulcorated with water until the salts of baryta no longer produce any reaction with it and then burned, after burning we see the reaction again taking place, though often only slightly, but always more or less. Mohr, therefore, recommends to rub down the oxide of zinc, with a little distilled water, to a fine pulpy mass, and to edulcorate it with hot distilled water, until no longer any reaction takes place. Furthermore, this has the effect of dividing and separating all those small lumps and granules generally produced by the burning; and the preparation, after being dried again, will have a finer appearance and be considerably whiter than before.—*Journ. Trans. Md. Col. of Pharm.*, June, 1859.

FLUID EXTRACT OF YARROW.

By CHARES TILYARD.

Having been requested by a medical friend to make for him (for use in his own case) some condensed form of the herb, and inasmuch as no preparation of the kind was obtainable, I was induced to experiment for the purpose; the result was the production of an extract satisfactory to him, beneficial in his own case, and in the case of others for whom he has prescribed it.

Yarrow, though heretofore used in domestic practice only, and then in the form of an infusion, possesses properties sufficiently medicinal and valuable to warrant it in assuming its proper place among official preparations.

The Physician above referred to informs me, that it possesses tonic, astringent and expectorant properties to a degree not generally known to the profession, and which requires in his estimation, more attention than has heretofore been bestowed upon it.

The following is the plan I have adopted, as producing after several trials, the most satisfactory results. Take of Yarrow (the recently dried herb) in coarse powder eight ounces, (offici-

nal) alcohol diluted (2 parts 95 per cent. alcohol and one part water) a sufficient quantity. Pour over the powdered herb, four ounces of the diluted alcohol, and work through with the hands until thoroughly moistened, allow it to stand in a covered jar for 24 hours. Pack closely in a funnel or other displacer and proceed to displace, until twenty-four fluid ounces are obtained, which, if performed with proper care, will exhaust the herb, as tested, by tasting the droppings. The resulting liquid should be exposed in a shallow dish (in summer to a draft of air under an open window, in winter on a shelf near the top of the room) and allowed to evaporate spontaneously until it measures sixteen fluid ounces. Thirty or forty grains bi-carb. potassa in powder may then be added, which retains the extractive in solution and clears the liquid, without interfering with its properties.

The evaporation of this fluid extract may be continued, if desired, with a very gentle heat (in a water-bath) until reduced to the consistence of an ordinary extract. The result in either case, fluid or solid, possesses in a marked degree the sensible and other properties of the herb, each teaspoonful representing 30 grains of the herb.—*Journ. Trans. Md. Col. of Pharm., June, 1859.*

NOTE ON THE ACTION OF NITRIC ETHER UPON IODIDE OF POTASSIUM.

By E. JUNCADILLA.

The action of nitric ether upon iodide of potassium is very complex; amongst other products hydriodic ether and a little ordinary ether are formed.

Equivalent proportions of iodide of potassium and nitric ether, mixed with their volume of alcohol, were put into a tube and sealed up, and then heated to 212° F. for 15 hours; the tube, opened after cooling, evolved a small quantity of gas, and contained a liquid strongly colored by free iodine. By distilling it, hydriodic and ordinary ether were separated.

The ordinary ether appears to result from the action of the hydriodic ether upon alcohol in an acid liquid, in accordance with the experiments of Reynoso. The gaseous products and

the free iodine are also due to some secondary reaction produced by the oxidizing action of the nitric acid.

The reaction which furnishes hydriodic ether is a new example of slow decomposition between a salt and an ether; it is represented by the equation



Lond. Chem. Gaz., May 16, 1859.—From Comptes Rendus, Feb. 14, 1859.

ON THE PREPARATION OF ANHYDROUS SULPHURIC ACID.

By M. OSANN.

Nordhausen sulphuric acid has a spec. grav. of 1.856, and only boils at 550° F. The consequence of these two properties is that in the reoccupation of the space formed at the bottom of the retort by the vapors of the acid, a percussion takes place which may easily break the retort.

To prevent such an accident, the author made use of a well-known means, consisting in the introduction of a coiled up platinum wire into the acid. It is necessary that one end of the wire should touch the bottom of the vessel, and the other project above the surface of the fluid. By this means the distillation of sulphuric acid may be effected over an Argand lamp without any danger.

In this case the author remarked that the distillate contained a much larger quantity of anhydrous sulphuric acid than is obtained by distillation without the platinum wire.

The receiver was placed in a water-bath at 50° F. White flakes were then seen in the distillate; they gradually increased, and it was observed that about half the acid became consolidated into a white mass of anhydrous sulphuric acid. If the receiver be taken out of the water-bath and exposed to the air, a portion of the distillate evaporates, whilst the rest solidifies to anhydrous acid. The author makes the following remarks in explanation of this fact.

The boiling-point of a fluid depends partly upon its individual nature, partly upon the pressure of the atmosphere, and lastly, in part upon the pressure exerted by superior strata of fluid upon the lower ones, supposing the heat to be applied from below. If the uppermost stratum of the fluid be brought to the

boiling-point, there is only the pressure of the atmosphere to be overcome; but if, on the contrary, the lowest stratum be heated to boiling, the pressure of the upper strata is to be overcome besides that of the atmosphere. The fluid must, therefore, in this case, boil at a higher temperature; but if there be in it a coiled platinum wire, passing from below upwards, the heat will be conducted from the bottom to the superior strata, and the uppermost stratum will boil sooner than the lowest. Now it is evident that as oil of vitriol is a mixture of anhydrous and hydrated acid, and the former boils at a lower temperature than the latter, the anhydrous acid will carry over more of the hydrated acid with it when the distillation is carried on at a high temperature, than when it is effected at a lower one. If, therefore, the uppermost stratum boils, comparatively very little of the hydrated acid can be carried over. The author, however, thinks it not improbable that the catalytic action of the platinum may have something to do with the effect produced.—*Ibid.*, from *Verhandl. der Wurzburger phys.-med. Gesellsch.*, Oct. 30, 1858.

ON THE ACRID PRINCIPLE OF RANUNCULUS SCLELERATUS.

By O. L. ERDMANN.

In compliance with the request of Professor Clarus, who is investigating the physiological and therapeutical action of *Pulsatilla* and other *Ranunculaceæ*, the author made some experiments with the acrid principle of *Ranunculus sceleratus*.

The fresh juice mixed with the aqueous liquid from the second expression of the plant, with the addition of water, yields an acrid clear distillate of a disagreeable odor, which, whether kept in open vessels, or in well filled and corked vials, is rendered milky, and gradually precipitates anemonic acid, which Schwarz obtained from the aqueous distillate of *Anemone pulsatilla* s. *Pulsatilla pratensis*. Dr. Trommsdorff remarks, that from a concentrated *Aqua pulsatilla*, anemonic acid, besides anemonin is separated in open and in well corked bottles; anemonic acid is precipitated first, anemonin afterwards; the not concentrated water only precipitates anemonic acid; accordingly,

it is not probable that anemonin by the atmospheric oxygen is oxydized to anemonic acid.

Neither anemonic acid, nor anemonin, are volatilized with the vapors of water. The distillate of *Ranunculus sceleratus*, on being shaken with ether, imparted to it a yellowish color; after evaporation of the ether, a golden yellow oil was left behind, heavier than water, vesicating when applied to the skin, and on smelling violently affecting the eyes. It has no reaction on litmus, and contains no sulphur. It gradually hardens to a white horn-like mass, thereby losing its odor; the supernatant aqueous liquid precipitated much flocculent anemonic acid. The moisture cannot be removed by chloride of calcium, the oil hardening the same as under water. Alcohol and chloroform extract anemonin from the hornlike mass, leaving anemonic acid behind.

The acrid principle of *Ranunculus sceleratus* is a volatile oil, which is easily changed into anemonin and anemonic acid; whether the contact of water or of air is necessary, could not be determined. Anemonic acid has no medicinal properties, anemonin possesses very little acrimony, but acts as a narcotic poison.—*Journ. f. prakt. Chem.* lxxv.—*Buchner's N. Repert.* viii. 55–58.
J. M. M.

ON THE WEIGHT OF DROPS.

By Dr. J. J. BERNOULLI.

The author was unable to find in pharmaceutical works any reliable facts concerning the weight of drops, and besides Mohr's, in his *Pharmacopœia Universalis*, II. 915, very few experiments. All statements are mostly based upon arbitrary suppositions, like that of the *Bavarian Pharmacopœia* of 1856, which states that "a drop is equal to 1 grain only of such liquids which are like chloroform considerably heavier than water." Evan L. Gmelin says in his "Handbook," "the cohesion of liquids is pretty nearly in proportion to their specific gravity." But the size of the drops must be dependent also on adhesion, and vary if dropped from vessels made of different material. There has been too little attention paid to this matter, which in many cases may probably give us a clearer insight into the

purity of some liquids, and the standard strength of some pharmaceutical preparations than the specific gravity can do; it is therefore to be recommended to make investigations with great accuracy, keeping in view the nature of the vessel, the temperature, the rapidity of dropping, and other circumstances calculated to affect the weight. The following are the medium results of the author's investigations, the figures in parenthesis denoting either the specific gravity, or the proportion of the articles contained in the liquids. 1 Swiss drachm=3.9062 grammes, gave drops of

Acetum plumbi (1.33).....	42	Petroleum.....	130
Acidum aceticum.....	50	Solutio Argenti nitr. (1:5).....	64
“ hydrocyan. spirit.....	126	“ Arsenic. Fowl.....	67
“ muriat. conc. (1.15).....	48	“ Camphoræ alcoh. (1:2).....	140
“ “ dilut. (1.018).....	46	“ Extr. Bellad. (1:2).....	126
“ sulphur. conc. angl.....	100	“ “ Hyoscyami (1:2).....	126
“ “ dilut. (1:6).....	70	“ Lactucarii Gallici (1:2).....	84
Æther.....	204	“ Morphæ acetat. (1:7).....	48
“ aceticus.....	135	“ Plumbi acetat. (1:5).....	27
Alcohol sulphuris.....	104	“ Potassæ carbonat. (1:2).....	36
Amylen.....	160	“ “ nitratis (1:5).....	45
Aqua destillata.....	52	“ Potassii iodidi (1:1).....	78
Bals. Copaivæ.....	105	“ Sodæ carbonat. (1:3).....	34
“ Peruvianum.....	65	“ “ nitratis (1:2).....	89
Chloroform.....	126	Spiritus æthereus.....	152
Elix. Acidum Halleri (1:1).....	100	“ camphoratus.....	120
Kreosot.....	100	“ muriatico-æther.....	150
Liq. Ammonia caust.....	63	“ nitrico-æther.....	150
“ Zinci muriat. (1:1).....	47	“ vini 30° Beck.....	152
Mixt. sulph. acida (1:3).....	124	“ “ 20° “.....	141
Mucilago Gi. arabici (1:3).....	42	Syrupus simplex.....	42
Oleum Amygdal. æth.....	80	Tinctura Aloes (1:6).....	124
“ “ dulc.....	89	“ Castorei spirit.....	120
“ Anisi.....	113	“ Cinchon. comp.....	136
“ Carvi.....	118	“ Ferri pomati.....	89
“ Caryophyl.....	108	“ Iodinii (1:11).....	158
“ Chamom. æth.....	146	“ Opii crocata.....	82
“ Croton Tigl.....	204	“ “ simplex.....	134
“ Fœniculi.....	100	“ Rhei vinosa.....	76
“ Menthæ pip.....	126	“ Valerianæ æther.....	158
“ Rosæ.....	142	Vinum Antimonii.....	71
“ Terebinth.....	105		

—(*Schweizer. Zeitschr. f. Pharm.* 1858, 97-100.)

J. M. M.

GLYCEROLE OF LEAD.

By CHARLES TILYARD.

The following is suggested as a substitute for Goulard's Cerate. This cerate, as is well known, becomes speedily rancid, and in

that state is more irritating than soothing to inflamed surfaces. The substitute does not change, is easily washed off with water, and can be reduced to any desired extent, for the purposes of a wash, with rose or distilled water.

Pure Glycerin,	13½ oz. (fluid).
Solution of Sub-acetate of Lead,	2½ oz. "
Camphor,	½ drachm.

Triturate the camphor into powder with a few drops of alcohol, add the glycerin, heat in a water-bath until the camphor is dissolved, when cool add the solution of lead and shake well together. These proportions are those for Goulard's Cerate, substituting glycerin for the oil and wax.—*Journ. Trans. Md. Col. of Pharm., June, 1859.*

MEL ROSÆ.

By ISRAEL J. GRAHAME.

In the preparation of Mel Rosæ of the Pharmacopœia a short time since, the writer was desirous of obtaining a result possessing more fully the characteristics contemplated by the formula, than any that he had seen made in accordance with it. Although it is a preparation of very limited use, yet it is believed that, if properly made, it would be more generally resorted to, not only as an agreeable but valuable astringent "addition to the gargles employed in inflammation and ulceration of the mouth and throat."

The following formula will be found easy of execution and productive of a handsome and otherwise satisfactory result:

Take of Red Rose leaves, in powder, (No. 50 sieve,) 2 ounces.

Clarified Honey, 20 fluid ounces.

Diluted Alcohol, sufficient quantity.

Oil of Roses, 4 drops.

Dampen the powder with the diluted alcohol and pack moderately firmly in a glass funnel displacer—place over the surface a piece of perforated filtering paper, and pour on the menstruum; set aside the first six fluid-drachms of liquid which pass, continue the percolation to exhaustion (about 6 fluid-ounces)—reduce this by water-bath at a temperature not exceeding 160° F., to ten

fluid-drachms, and having mixed this with the portion first obtained, add the oil of rose and mix the fluid extract thus made with the clarified honey.

As thus prepared Honey of Roses is highly astringent, and possesses much richness of color and flavor.—*Journ. Trans. Md. Col. Pharm., June, 1859.*

ON THE ESTIMATION OF THE ORGANIC MATTER OF THE AIR.

By ROBERT ANGUS SMITH, Esq., Ph. D., F. R. S.

After describing the opinions concerning organic matter in the air, and the various attempts made to estimate the amount, the lecturer described a method of obtaining the relative quantity by means of mineral chameleon, permanganate of potash or soda. This mineral had been proposed by Forchammer as a mode of estimating the organic matter in water, but it was capable of estimating quantities much more minute. At first the air was passed through the solution of chameleon, but this was not found to cause complete action. It was necessary that the air should remain for some time in contact with the solution to be decomposed. It was then ascertained that the relative amount of organic and other oxidizable matter in air could be found by a simple metrical experiment in a few minutes.

The lecturer then said:—In working out this idea, it has been found that a vessel of the capacity of 80 to 100 cubic inches is the most convenient. This is equal to rather less than a quart and a half, [Imp. mea.] and rather more than a litre and a half.

The solution of chameleon used must be extremely weak, so that small quantities cannot readily be distinguished by gaslight. 600 grains of it are required to decompose 5 grains of a standard solution of oxalic acid. The standard solution of oxalic acid is so made that 1000 grains neutralize 1 grain of carbonate of soda. A thousand grains contain therefore 1.184 grain of crystallized oxalic acid.

To prepare the solution, a manganate was formed by heating nitrate and carbonate of soda and manganese, assisted by a little chlorate of potash. There was the most minute trace of nitrate

remaining in the solution. Perhaps chlorate of potash would have been better, but I had no idea at the time of the difficulty afterwards found in obtaining the same quality. A solution of this manganate was made in pure water, and carbonic acid passed through until a reddish purple shade was obtained. It was then tested by oxalic acid, adding three or four drops of pure sulphuric acid. The purest water obtainable was added to dilute it to the proper amount. This often failed; and I have sometimes for a whole week failed to obtain the proper solution. Although I call it permanganate, it is not entirely so; it is a mixture of manganate and permanganate. A permanganate of the strength described has a dingy appearance and uncertain color. I do not doubt that a pure permanganate of a suitable strength may be obtained pleasant to work with. There is some difficulty in obtaining pure water for preparing the solution. If allowed to stand for some time with a manganate it becomes purified.

The solution of chameleon is apt to change, although slowly, even when it is hermetically sealed in a glass tube. The solution described had become nearly colorless when sealed up hermetically for about three months. It is found readily to change when it is exposed to air by frequent removal of the stopper of the bottle containing it. Its strength must be tested occasionally; and if it differs from the standard, a calculation must be made for its reduction. The strength of the permanganate solution is extremely small. A few grains of the ordinary solutions of manganese used will make some thousand grains of the solution here employed. The reason of this lies in the extremely small amounts of organic matter found in even the worst air.

The vessel used is simply a bottle with a perforated stopper, through which pass two tubes. To one of these a stopcock is attached, to the other a clasp or stopcock. The standard size proposed is 100 cubic inches; and to this all the experiments have been reduced; the vessels actually used contain between 80 and 100 cubic inches of air. The stopcock is of glass, or of hard caoutchouc, which is still better. When the bottle is to be filled with the air to be tested, the stopper is removed, and the pipe of an exhausting pump is inserted, reaching to the bottom of the bottle. The pump is made like a cylindrical bellows of about 8

inches long when stretched out, and about 4 in diameter, and is compressible into the thickness of about 2 inches. The sides are made of thin Mackintosh cloth. By the use of the pump the air of the vessel is removed, and the external air of course enters. A few strokes of the pump are sufficient, *i. e.* from 6 to 10. After ten strokes I perceive no change, and am inclined to think that it is an unnecessary number. The test liquid is poured into a graduated tube or burette, containing somewhat more than will be required. A portion is then poured into the tube which passes through the stopper, and the stopcock is opened to allow it to pass. Small quantities are used; when it has entered the bottle, the liquid is made to spread over the sides, and time given it to be exposed to the action of the air; it is found that in five or six minutes a decided epoch is attained from which to date the comparative action.

In order to see the color the liquid must be allowed to trickle down the sides of the vessel, and collect itself at one point of the circumference at either end of the cylindrical part of the bottle. This part must be raised up to the level of the eye, so that the longest axis may be presented to the sight, and thereby the deepest shade of color. It requires some time to accustom oneself to the sight of such a small amount of color; but when it is once well observed, it will be found to be a method which will admit of the greatest precision. The first few drops which are poured in will probably be decolorized at once: a few drops more must then be added; if they become decolorized, a few more must be used; and so on until there is a perceptible amount of color remaining. When this occurs, the experiment is concluded. The amount of the reagent used is then read off from the graduated measure. If the liquid be of the proper strength, and the bottle the required size, the number of grains gives the comparative quantity at once. Sometimes the amount of organic matter is so small that there is no appreciable action, on even the smallest amount of solution by one vessel of air. In this case it is necessary to fill the bottle several times. The mode of doing this is apparently extremely rude, but the results are such as not to demand a finer method at present. A finer method, of course, would need little ingenuity to contrive. At present I merely remove the stopper and fill again with air as

before. During the period of filling the vessel the surface of the liquid is reduced to its smallest amount, and the change it undergoes is either inappreciable, or so constant as not to affect the results.

In analysing the air in this manner, it is found that a decided result is attained in about five minutes. Sometimes the result is decided in one; that is, there is a termination to the rapid action. This peculiarity is probably to be explained by the following experiments. If we pour decomposing matter on the permanganate solution, it is rapidly destroyed. If the matter be not in a state of decomposition, the action is much slower.

These different results promise a mode of dividing the organic matter of the air into classes according to its quality. These facts are mentioned merely as germs of a future inquiry. In large towns, where coals containing much sulphur are burnt, the sulphurous acid takes the oxygen of the chameleon, and an apparently large amount of organic matter results. This sulphurous acid is of itself an impurity, perhaps as hurtful as some kinds of organic matter.

We measure by this means the amount of oxygen needful for the oxidizable matter of the atmosphere, and all such matter is impurity, in some places entirely organic; in others, such as towns, mixed with inorganic gases.

Some of the principal results obtained by this method were as follows:—

*Relative quantities of Organic and other Oxidizable Matter in the Air of**

Manchester (average of 131 experiments)	52.9
“ All Saints, E. wind (37 experiments)	52.4
“ “ W. wind, less smoky (33 expts.)	49.1
“ “ E. wind, above 70° F. (16 expts.)	58.4
“ “ “ below 70° F. (21 expts.)	48.0
“ In a house kept rather close	60.7
In a pigstye uncovered	109.7

* A few of these results were published in the ‘Athenæum’ during last summer. The present numbers are somewhat higher, being reduced, for the sake of uniformity, to correspond to a vessel of 100 cubic inches.

Thames at City, no odor perceived after the warmest weather of 1858	58.4
Thames at Lambeth	43.2
“ Waterloo Bridge	43.2
London in warm weather (six experiments)	29.2
“ after a thunder-storm	12.3
In the fields S. of Manchester	13.7
“ N. of Highgate, wind from London	12.3
Fields during warm weather in N. Italy	6.6
Moist fields near Milan	18.1
Open sea, calm (German Ocean, 60 miles from Yarmouth)	3.3
Hospice of St. Bernard, in a fog	2.8
N. Lancashire	about same
Forest at Chamouni	2.8
Lake Lucerne	1.4

The first experiments undertaken were in Manchester, and the average amount obtained was in the city about 50, gradually diminishing in moving towards the country until it was found in the fields at 13; on passing a sewer stream about a mile from the outskirts, the amount rose to 83. The atmosphere on the Thames was not measured whilst at its worst, but immediately afterwards; when, however, it had ceased to affect the senses of most persons at least, the amount was very high, viz. 58. I was anxious to know how far the Thames affected the atmosphere of London, and tried some experiments: the result was that the influence appeared to cease almost immediately; the fact of a block of houses standing in the way was enough to prevent the influence; when at the worst this may not have been the case; to arrive at the other side of the block, the vapor would generally require to rise high, so that it would become mixed with a great deal of air. The amount obtained in a few trials in the streets of London was 22 to 34; going on to Highgate, the numbers sank from 33 to 24; on descending the north side of Highgate Hill a distinct change was perceived, the numbers being 18; the wind meantime was blowing from the city: the few experiments made in the fields in summer gave 10 to 12. The numbers 6 to 18 were obtained in Switzerland and Lombardy. The moist fields around Milan gave 18; when the water passes off the rice

fields, producing the unhealthy season, I do not doubt that the amount will be much higher. It was not convenient for me to stay, nor to go further to places distinctly infected with malaria. I was desirous of trying it in some of the hovels of the Vallois and the Val d'Aosta, but the weather being fine, and the people living much out of doors, the inquiry was not encouraging. The few experiments made did not give very striking results, whereas the lower parts of our own towns gave results most decided. I imagine the cause of this to be that a drier air does not allow the offensive matter to rise so readily. This fact has many ramifications, but it will explain several difficulties in our sanitary science. It is with the assistance of moisture that the organic matter is conveyed into the air.

Moisture itself, as may be supposed, does not produce any action on the test; one of the lowest numbers obtained was on the German Ocean, about 60 miles from land; the day was calm and clear. In the straits of Dover, when the wind was blowing briskly from the German Sea, the amount obtained was very high, but as there was a slight spray the experiments were disregarded. About 8000 feet high on the Alps, a dense fog showed also one of the smallest amounts obtained; the ground was entirely bare rock, and could not give out organic matter. The amount was 2.8.

The influence of height was very decided; in the higher grounds of Lancashire, near Preston, the numbers being from 2 to 4. A wind blowing down from the Mer de Glace gave rather more than at a lower point, although coming down the hill; a dry pine forest in the neighborhood, although very fragrant, did not appear to raise the number. The influence of the sea and of height seem equally decided.

A few hasty experiments made in the hothouses at Kew led me to believe that there was less increase there than might have been expected, the amounts obtained being less than in London, but more than outside the houses, where it was cooler. At the same time weeks or months should be given, when only hours were allowed for the experiments.

The influence of heat appears to be to increase the amount, when there is moisture present.

The influence of dryness seems to be towards diminishing the amount.

The influence of great cold has not been tried yet.

The influence of rain in hot weather, to some extent of course a cooling influence, but chiefly a means of washing the air, seems most decided. After a thunder-storm and shower at Camden Square, the number, which was previously 31, fell to 12.

The influence of our towns, especially our smoky towns, is most decided also; it is easy to tell by this test, when in the outskirts of a town, whether the wind is blowing from the town or the country.

A distinct difference was always found between the front and back of Manchester houses: a similar difference obtained when a room had been inhabited for some time, and the difference was of course very marked when the smell of a sewer came into the house. I had a good opportunity of observing this in my laboratory last year.

It must be remembered that the numbers given for some places were obtained on one day of the year only, and we must be careful not to draw too many conclusions: we have yet to learn what kind organic matter is wholesome and what is unwholesome. I believe that this is the next great point to be attended to; at present we are only becoming able to ascertain the gross amount. I feel this caution to be needful, lest the numbers should be used to prove too much.—*London Chem. Gaz.*, May 2, 1859.

BITTER WINE OF IRON.

By WILLIAM S. THOMPSON.

Having been requested by a medical friend to make the preparation above named, to contain one grain of Wetherill's precipitated extract of bark and two grains of citrate of iron in a teaspoonful of sherry wine, I devised the following formula, after several experiments:

Take of solution of persulphate of iron (containing 60 grains of dry oxide to the fluid ounce,) . 17½ fluid-drachms.
Citric acid, 6 drachms.
Sherry wine, 24 fluid-ounces.
Water of ammonia, a sufficient quantity.
Wetherill's precipitated extract of bark, 224 grains.

Dissolve the precipitated extract of bark in the wine and filter through paper. Dilute the solution of persulphate of iron with a sufficient quantity of water, (about one quart) and add a sufficient quantity of water of ammonia to precipitate the peroxide; wash the precipitate in the usual manner, drain it on a muslin filter, transfer the washed magma to a porcelain dish, and add the citric acid previously reduced to a fine powder, then apply a gentle heat, stirring constantly until the oxide is dissolved, when add three and a half drachms of water of ammonia; taking care that the latter is not in excess. The bright green solution of ammonio-percitrate of iron obtained, should be reduced by gentle evaporation to four fluid ounces, and then poured into the 24 fluid-ounces of vinous solution of precipitated extract of bark, above described. Our medical friend prefers, in some cases, the above preparation of half the given strength, which is prepared by using wine enough to make the whole measure 56 instead of 28 fluid-ounces. The flavor of the wine may be improved by the addition of a small quantity of strong tincture of orange peel, or a few drops of fresh oil of orange.—*Journ. Trans. Md. Col. Pharm., June, 1859.*

ON THE MANUFACTURE OF SULPHATE OF BARYTA.

By J. PELOUZE.

Several manufacturers of chemicals prepare sulphate of baryta, known by the name of "*baryta-white*," by treating native carbonate of baryta with hydrochloric acid, and precipitating the solution obtained by sulphuric acid; thus regenerating the hydrochloric acid which may be used for further operations.

This sulphate, in spite of its being dearer than that which is prepared by other less costly processes, is always preferred to the latter for painting.

I have discovered that a sulphate of baryta, similar to that now in question, can be obtained by treating directly carbonate of baryta with dilute sulphuric acid, without its being necessary to pulverize the former. A very small quantity of hydrochloric acid, 3 to 4 hundredths for example, is added to the diluted sulphuric acid, and the whole kept at a slight ebullition. The

pieces of carbonate of baryta, no matter how large, are acted upon and completely transformed into a fine white power entirely composed of sulphate of baryta, and of the greatest tenuity.

If the same experiment is made without the addition of hydrochloric acid, the carbonate is acted upon very slowly. The part which hydrochloric acid plays in this reaction is easily understood. It forms a soluble chloride of barium which sulphuric acid decomposes, reproducing hydrochloric acid always in the same quantity, so that it is in fact the latter acid, not the sulphuric acid, which acts upon the carbonate of baryta.

This experiment becomes still more interesting if dilute sulphuric acid be placed with a few pieces of carbonate of baryta in two matrasses, and brought to a boiling-point; then with the end of a glass rod introduce into one of them a few drops of hydrochloric acid. A white powder will be seen to detach itself in increasing quantity from the pieces of carbonate, and at the same time an effervescence will take place owing to the disengagement of the carbonic acid. In the other matrass nothing of the kind takes place; the liquid is hardly rendered turbid by a scarcely perceptible trace of sulphate of baryta.

In this case a similar phenomenon takes place, as in the manufacture of white lead by the Dutch process, in which a trace of vinegar is sufficient to determine the oxidation of an enormous quantity of lead. Without the agency of that acid the lead would not be acted upon by air or carbonic acid. In like manner, although in a lesser degree, carbonate of baryta resists the action of sulphuric acid without the presence of hydrochloric acid.

I thought that marble would be acted upon still more easily than carbonate of baryta by a mixture of diluted sulphuric acid and a small quantity of hydrochloric acid; but my experiments have given a result contrary to my expectations. Under the same conditions as those pointed out for carbonate of baryta, marble is acted upon with more difficulty and more slowly than the last named salt. The addition of a relatively large quantity of hydrochloric acid shortens very little the time it takes to be converted into sulphate of lime. The pieces of marble are deeply impregnated with sulphate of lime. I do not know the cause of this difference of action; but, at all events, I have been obliged

to give up the hope which I entertained that marbled and compact calcareous stones, under the influence of dilute sulphuric acid and a small quantity of hydrochloric acid, might produce an easy and regular disengagement of carbonic acid without being previously pulverized, which might have been turned to useful account by manufacturers of aerated waters.—*Lon. Chem. Gaz.* June 1, 1859, from *Comptes Rendus*, April 18, 1859.

ON HÆMATOXYLIN.

By O. L. ERDMANN.

The following experiments were made by C. Hesse in Erdmann's laboratory. The hæmatoxylin was prepared by Erdmann's method by means of aqueous ether. By subsequent recrystallization from water, to which a little sulphite of ammonia or soda is added, it is obtained in perfectly colorless crystals. These contain more or less water of crystallization as was previously stated by the author. Crystals with a larger quantity of water of crystallization were analysed; the analysis agreed well with the formula given by Gerhardt, $C^{32}H^{14}O^{12} + 6HO$,—

	Found.	Calculated from		Previous experiments				
		$C^{40}H^{17}O^{15}$	$C^{32}H^{14}O^{12}$	of Erdmann.				
C	63.21	63.67	63.57	63.19	63.62	63.72	63.66	63.17
H	4.68	4.51	4.63	4.65	4.70	4.69	4.68	4.70
		$C^{40}H^{17}O^{15}$	$C^{32}H^{14}O^{12}$					
		+8HO.	+6HO.					
Water of crys- tallization }	15.30	16.03	15.17	16.37	16.51	16.09		

If a solution supersaturated at ordinary temperature be left standing, larger crystals are obtained in time; these usually have smooth faces which are sometimes strongly curved.

The crystals with a smaller quantity of water of crystallization were determined by Naumann. They belong to the rhombic system. The amount of water found was =5.40, 5.53, 5.61 per cent., the formula requires 5.62 per cent.

When hæmatoxylin is treated with boiled solution of potash in an atmosphere of hydrogen, it is but slightly colored even by

boiling. When saturated with sulphuric acid, the fluid becomes red; but white hæmatoxylin may be obtained from it again. Carbonate of soda behaves in the same way. Yeast (in a few days at 86° F.) or emulsine (in 6 hours at 113° F.) colors the solution of the substance red; it then contains some hæmateine besides hæmatoxylin. Even concentrated muriatic acid effects no essential decomposition.

Hæmatoxylin reduces Fehling's solution. It diverts the plane of polarization strongly to the right. The experiments show for 1 grm. $C^{12}H^{14}O^{12}$ in 100 grms. of water, with a length of tube of 200 millims., an average of $-1^{\circ}.85$ to the right.

Hæmatoxylin is soluble in a cold saturated solution of borax until it comes to the consistence of a syrup. From a solution of this kind the coloring matter cannot be recovered in a crystalline form by evaporation. By taking up hæmatoxylin the solution of borax loses its basic reaction, and afterwards has either a neutral or weakly alkaline reaction upon litmus-paper. The borax cannot be precipitated from such a solution by absolute alcohol, or by a mixture of absolute alcohol and ether. It exhibits a bluish fluorescence.

If a few drops of muriatic acid be let fall into this fluid, a violent movement is observed in it, and in 10—20 seconds the entire fluid is converted into a dense crystalline mass. The vessel may then be turned upside down, without the mother-liquor flowing out. But within a few hours a conversion of the crystals commences; granular crystals make their appearance, and settle to the bottom of the vessel, and above them there is a large quantity of fluid. These granular crystals consist of $C^{32}H^{14}O^{12}+2HO$. Sulphuric acid and acetic acid behave in the same way as muriatic acid. If, on the other hand, a concentrated solution of chloride of sodium be dropped into such a solution, each drop sinks to the bottom enveloped in an amorphous mass. In this way many drops of solution of chloride of sodium may be seen depositing themselves one upon the other in the boracic solution. If the fluid be stirred round, a slimy, emulsive fluid is produced, from which a tenacious mass is deposited in a short time. This possesses a silky lustre, which is caused by small cavities. The mass, which is at first but slightly colored, soon becomes red, as it is very sensitive to light and

ammonia. It dissolves pretty readily in boiling water or alcohol, but separates in its previous form on the cooling of the solution. It consists of amorphous hæmatoxylin, and this may perhaps be the reason why solution of hæmatoxylin in biborate of soda produces a greater or less deviation in polarized light. A similar behaviour to that of chloride of sodium is also exhibited by the chlorides of potassium and ammonium, ferrocyanide of potassium, and bisulphite of ammonia, but chloride of sodium gives the most beautiful precipitate. Oxalate of potash, and sulphate, phosphate, and carbonate of soda produce no precipitates. Bisulphite of ammonia dropped into the solution of hæmatoxylin in borax, immediately produces a slimy precipitate. This disappears when the solution is boiled, but separates again in its characteristic form on its cooling. By continued dropping of bisulphite of ammonia into the syrupus fluid, the point is soon reached at which the amorphous hæmatoxylin disappears. Crystals of hæmatoxylin are then very soon obtained. If amorphous hæmatoxylin be dissolved in boiling water, and a drop of muriatic acid be added to it, so that a distinctly acid reaction is produced, crystals are very soon obtained, usually with 2HO .

Hyposulphite of soda when heated dissolves considerable quantities of crystallized hæmatoxyline; the solution has a purple color, and on cooling deposits amorphous hæmatoxylin, which appears somewhat colored.

Hæmatoxylin is rather difficult of solution in solution of chloride of sodium, but dissolves more readily in solution of chloride of barium. From the latter fluid the crystals $\text{C}^{32} \text{H}^{14} \text{O}^{12} + 6\text{HO}$ separated, but in the course of 24 hours these had become completely transformed into $\text{C}^{32} \text{H}^{14} \text{O}^{12} + 2\text{HO}$. Phosphate of soda,

$\left. \begin{matrix} (\text{NaO})^2 \\ \text{HO} \end{matrix} \right\} \text{PO}^5$, is capable of dissolving a large quantity of hæmatoxylin, and behaves very like the solution of borax, but retains its basic reaction. When carefully employed, it but slightly reddens hæmatoxylin.—*Chem. Gaz., June 15th, 1859, from Journ. für Prakt. Chemie.*

A COMPOUND OF IODIDE AND NITRATE OF SILVER.

Dr. Hofmann has described, at a meeting of the Chemical Society, a compound of iodide and nitrate of silver, which was obtained by treating a mixture of iodide and oxide of silver with nitric acid. He found that the iodide fused in the boiling liquid, forming an oily-looking stratum at the bottom of the vessel, which solidified on cooling into a crystalline mass. This salt, when treated with water, was resolved into nitrate and iodide of silver. Upon further examination of this compound, he found that its composition varies according to the relative quantities of its constituents originally present, and the amount of nitric acid employed. From the result of several experiments, he found the limits of combination in the fusible compound to be as follows:—

	I.	II.
Nitrate of Silver, . . .	69.52 . . .	33.67
Iodide of ditto . . .	29.84 . . .	65.55

The first of these results corresponds to the formula $3(\text{AgO}, \text{NO}_3), \text{AgI}$, while the second may be represented as $2(\text{AgO}, \text{NO}_3), 3(\text{AgI})$.

By continued ebullition, the proportion of iodide of silver may be still further increased, but the compound then no longer fuses in boiling concentrated nitric acid.

A combination of iodide and nitrate has been also observed and suspected by other chemists, although no analysis or examination appears to have been made, excepting by Dr. Hofmann. Mr. F. Maxwell Lyte, in a recent letter to the *Journal of the Photographic Society*, alludes to such a combination:—

“It is, I believe, allowed by many, though not by all, that there does exist a compound of the iodide with the nitrate of silver; but the various forms and properties of this substance, and the important part it plays in photography, have been little, if at all, separately examined, and I now propose to mention a few facts and considerations with regard to it.

“We have the iodo-nitrate of silver, if we may so call it, under three different forms:—First, in solution, when we dissolve iodide of silver in the negative nitrate bath; secondly, in the

amorphous form, as it appears on the surface of the collodion plate; and, thirdly, it may be obtained in the crystalline form by adding recently precipitated iodide of silver to a nearly saturated solution of silver nitrate, when it will be found that much of the iodide, which at first dissolves, reprecipitates as a crystalline iodo-nitrate, and that even the excess of iodide which remains undissolved slowly becomes converted into a similar crystalline deposit. This crystalline iodo-nitrate is sensitive to light, like the amorphous deposit on the sensitized plate, and it may be dried without losing its crystalline form; but as soon as it is touched by water it decomposes, loses its silver nitrate, and by sufficiently prolonged washing, becomes reconverted into silver iodide, as insensible to light as it was before being placed in contact with the silver nitrate. The amorphous deposit on the plate is subject to exactly the same laws, only it is rather more sensitive than the crystalline iodo-nitrate, a difference probably attributable to the crystalline form of the latter; but by washing, it loses, like it, its combined nitrate, and becomes equally insensible to light, while at the same time it passes from a straw-yellow to a pale primrose.

"Now, what results from the consideration of the above facts?* Simply, that by their means we are enabled to explain several of the rules which practice has from time to time given to photography. As the iodide of silver, when placed in a concentrated solution of silver nitrate, first dissolves and then reprecipitates as crystalline iodo-nitrate, we can understand why it is that in practice it is found inconvenient to employ a bath of nitrate of silver over a certain strength, as it infallibly destroys the sensitive film; and for a similar reason we should not allow the nitrate bath to concentrate by evaporation and dry on the plate. Again, we destroy the sensibility of the plate by prolonged washing, since we thus decompose the iodo-nitrate upon its surface, as above described; and, lastly, when we wish to preserve the sensibility of a collodion plate, we wash it with a

* "It is also curious to observe the change of color which takes place when iodide of silver, which has been precipitated in presence of an excess of iodide of potassium, is added, after being well washed, to a solution of silver nitrate, when its color will be seen to change at once from pale primrose to a deeper and more brilliant yellow."

glutinous or syrupy liquid, which, by enclosing each atom of the iodo-nitrate, protects it from decomposition while we are getting rid of the superfluous nitrate.*

"Is it not also highly probable that the accelerating action of many salts, as acetates, nitrates, fluorides, &c., the use of which has been so much questioned by some, and recommended by others, may be attributable to the formation of iodo-acetate, iodo-fluoride, &c. of silver? Iodide of silver is not the only salt of this metal which possesses the property of retaining the nitrate in combination. The chloride and bromide have the same property, though in a less degree, and probably many others also; and we find the following passage in *Turner's Chemistry*, under the head of 'Tribasic Phosphate of Oxide of Silver:—'This compound subsides of a characteristic yellow color, when the rhombic phosphate of soda is mixed in solution with nitrate of oxide of silver. . . . It is apt to retain some of the nitrate in combination.' This doubtless arises from a similar reaction to the one I have described above."—*London Pharm. Jour. and Trans. July, 1859.*

THE ADELHEID SPRING,

An Iodo-bromine Water at Heilbrunn, in Bavaria.

Communicated by A. ALBRIGHT, Esq.

The small village of Heilbrunn (literally *Healing-water*), lies eight German miles from Munich, near Benedictbeuren, formerly a monastery, upon a considerable elevation, commanding charming prospects. According to historical traditions, it may be considered the oldest medicinal spring in Bavaria, and it is said to have been destroyed, together with the monastery to which it

* "It was the knowledge of the fact of the existence of this iodo-nitrate of silver—which is decomposable by water, but not so by washing with a weaker nitrate bath—which induced me, when I first published my 'Honey Process,' to recommend the addition of nitrate of silver to the syrup. This addition has since been proved by Mr. Shadbolt to be, with certain precautions, unnecessary, as the glutinous nature of the honey itself, coupled with the porosity of the collodion film in which the iodo-nitrate is formed, suffices to protect that compound from decomposition."

belonged, by the Hungarians in 985. A century later (1059) the monks made some excavations, and the source of the spring was discovered at a depth of four fathoms. At the same time a fire burst forth over it, which occasioned the belief that the spring itself was produced by a miracle.

In 1659, the Princess Adelheid, the Elector Ferdinand's wife, who, after being married eight years, was without children, resorted hither, and in a year afterwards bore a daughter, and subsequently other children. It is from this circumstance that the spring has acquired the name of Adelheid's Quelle, bestowed upon it by the present abdicated King Louis of Bavaria. Though this cure brought the spring into greater reputation, it was allowed nevertheless to fall into neglect and disrepair by the monastic authorities, and it was only used for a long time by the country people for the cure of scrofulous and other diseases, and by the villagers for mixing their bread, from finding less salt thereby required.

The reputation of the spring for the cure of scrofula, caused Dr. A. Vogel, of Munich, to investigate it in 1825 for iodine, which he found it to contain in important quantity, and on this its use came to be prescribed by the physicians of Munich and Augsburg.

In the course of the alterations and deepening of the spring, which this more extensive use required, a candle having been brought near the surface, the gas escaping from the bubbles took fire, and it was only after some pains that the flame was put out; thus was the miracle of 1059 explained. In fact, a considerable covering of carburetted hydrogen floats over the mirror of the spring, which will inflame with a sharp crack. At this period the water began to be bottled and exported, and this is continued to the present day to a large and lucrative extent. Its reputation and interest has led within the last 25 years to its analysis by the following eight distinguished chemists: by Vogel, in 1825; Dengler, 1826; Fuchs, 1833; Barruell, 1835; Bauer, 1841; A. Buchner, jun., twice, 1842; Pettenkofer, 1849.

According to the latest analysis by the University Professor, Dr. Pettenkofer, of Munich, with all the required exactness of

the present standard of chemical science, there are contained in 16 Bavarian ounces (480 grammes) of the water—

Bromide of Sodium.....	0.3678 grains	} Fixed Constituents.	
Iodide of Sodium.....	0.2199 "		
Chloride of Sodium.....	38.0684 "		
Chloride of Potassium.....	0.0200 "		
Sulphate of Soda	0.0480 "		
Carbonate of Soda.....	6.2168 "		
Carbonate of Lime.....	0.5840 "		
Carbonate of Magnesia.....	0.1440 "		
Carbonate of Iron.....	0.0720 "		
Alumina	0.1424 "		
Silica.....	0.1472 "	} Absorbed in the Water.	
Phosphate of Lime.....	a trace		
Organic Matter.....	0.1648 "		
Free Carbonic Acid.....	13.18 cubic centimetres		
Carburetted Hydrogen....	8.02 "		
Nitrogen	6.54 "		
Oxygen	1.38 "		
In 100 measures of the gases escaping from the spring are contained—			
Carburetted Hydrogen.....	75.5 measures.		
Nitrogen.....	18.0 "		
Oxygen	2.2 "		
Carbonic Acid.....	4.3 "		

100

The bromine being in excess of the iodine, it has in Germany rightly obtained the name of an iodine containing bromine-water [*Iod-haltendes Brom-wasser.*]

The peculiarity of the spring does not rest, however, either upon one or another of its constituents, but upon the qualitative mixture as a whole, and regarded in this light it stands quite alone. The greater number of iodine and bromine springs are either altogether wanting in two ingredients which play an important part in the Adelheid spring, viz., the carbonate of soda and the carburetted hydrogen, or they contain an excess of common salt. It is the considerable quantities of iodine, bromine, carbonate of soda, and carburetted hydrogen, with a relatively low adjunct of common salt, which lends to this spring its simultaneous dissolving, calming, anodyne effect on the mucous membrane of the stomach and the urinary organs, and which belongs to no other bromine or iodine spring.

When the water is poured into a glass, a multitude of bubbles of gas are formed, and the taste is nearly that of weak salted meat broth. *It excites the appetite, increases the urinary secretion, operates powerfully on the absorbents, and the lymphatic*

and glandular systems, brings morbid deposits in the organic tissues into a solvent condition, and promotes their removal out of the system by the increased secreting and excreting activity of the kidneys, and this whether the same have been occasioned by simply inflammatory, scrofulous, syphilitic, or gouty affections. The diseases in which extensive experience has proved its curative effects, are, scrofula and glandular swellings, bronchial affections, disordered condition of the follicles of the mucous membrane, and thickening of the membrane itself, mesenteric disorders, enlargement or hardening of the testicle, female disorders of the womb generally. *It is especially distinguished above all ordinary remedies* for its effects in urinary diseases. Also in diseases of the bones and joints. In one case of excessive obesity it effected a cure by a reduction in the weight of the body of 133 pounds. It only remains to state that the water preserves its equality for years, in fact indefinitely, and that the salt, &c., that it contains are brought into a saleable form, and that both the water itself and the salts will soon be probably on sale in London.—*London. Pharm. Journ.*

ANALYSIS OF HIGHLAND "CUTWEED" KELP.

By JOHN LAMONT, Student in Dr. Wallace's Laboratory, Glasgow.*

Although kelp is prepared in large quantities for the iodine manufacture, very few analyses have been made of it. Indeed, the only reliable analysis published in the chemical journals is that of a specimen of Orkney "drift-weed" by Mr. George W. Brown.†

The subject of the present analysis is cutweed kelp, so called from its being prepared from sea-weeds cut away from the rocks at low water. It was manufactured at the Island of Uist, one of the Hebrides, during the summer of 1858.

The method of analysis was similar to that adopted by Mr. Brown, with improved processes, however, for the estimation of the phosphoric acid, alumina and iodine. The phosphoric acid existing in the insoluble matter is calculated into phosphate of

* Communicated by the Author.

† Proceedings of the Phil. Soc. of Glasgow, vol. iii. p. 208.

lime, but the precipitate obtained by the addition of ammonia contained a considerable quantity of magnesia, as well as alumina and oxide of iron. The iodine was estimated by the process described in the "Chemical Gazette" for the present year, p. 137; the mean of three determinations was taken. The silicate of lime was calculated according to the formula $2 \text{CaO}, \text{SiO}_2$.

The general analysis gave as follows:—

Soluble salts . . .	60.9
Insoluble " . . .	36.1
Moisture . . .	3.0

100

Soluble Salts.

Sulphate of potash . .	7.74
Chloride of potassium .	19.86
Chloride of sodium . .	3.47
Iodide of sodium20
Sulphide of sodium . .	2.92
Hyposulphite of soda .	1.98
Sulphite of soda . . .	2.71
Sulphate of soda . . .	15.10
Phosphate of soda . .	.95
Carbonate of soda . .	5.15
Loss82—60.9

Insoluble Salts.

Sulphide of calcium . .	2.09
Phosphate of lime . .	6.44
Carbonate of lime . .	11.17
Magnesia	5.70
Alumina23
Oxide of iron	1.42
Silicate of lime . . .	2.77
Sand	1.65
Carbonaceous matter .	3.30
Loss	1.33—36.1
Moisture	3.00

100

The process adopted in the manufacture of kelp is well known to have two very serious objections, the volatilization of a portion of the iodine, and the reduction of a part of the sulphuric acid, giving rise to the presence of sulphides, hyposulphites, and sulphites in the product. The following process has been tried on the small scale with marked success. The weeds are boiled with a small quantity of water, the liquor evaporated to dryness, and the residue charred very carefully. The mass, dissolved in water, gives a colorless solution which is quite clear from sulphides, and may be at once boiled down to extract the salts, as in an iodine work, or simply evaporated to dryness, and sold as kelp. I am enabled, by the kindness of Dr. Wallace, to give an analysis of kelp so prepared, chiefly from *Laminaria digitata*.

Sulphate of potash	. 14.85
Chloride of potassium	. 42.49
Chloride of sodium	. 36.47
Sulphate of soda	. 3.90
Iodide of sodium	. 1.78
Carbonate of soda	. 1.01

100

London Chem. Gaz. June 1, 1859.

NOTE ON OZONE.

By THOMAS ANDREWS M.D., F.R.S., and P. G. TAIT, M.A., F.C.P.S.

Since the publication of their "Note on the Density of Ozone" (*Chemical Gazette* for August 15, 1857), the authors have been occupied with an extended investigation into the nature and properties of that body. The inquiry having proved more protracted than they anticipated, they have thought it proper to send to the Royal Society a brief notice of some of the more important facts which they have already observed, reserving a description of the methods employed, and of the details of the experiments, for a future communication.

The commonly received statement, that the whole of a given volume of dry oxygen gas contained alone in an hermetically sealed tube can be converted into ozone by the passage of elec-

trical sparks, is erroneous. In repeated trials, with tubes of every form and size, the authors found that not more than $\frac{1}{100}$ part of the oxygen could thus be changed into ozone. A greater effect was, it is true, produced by the silent discharge between fine platina points; but this also had its limit. In order to carry on the process, it is necessary to introduce into the apparatus some substance, such as a solution of iodide of potassium, which has the property of taking up, in the form of oxygen, the ozone as it is produced. After many trials, an apparatus was contrived in the form of a double U, having a solution of iodide of potassium in one end, and a column of fragments of fused chloride of calcium interposed between this solution and the part of the tube where the electrical discharge was passed. The chloride of calcium allowed the ozone to pass, but arrested the vapor of water; so that, while the discharge always took place in dry oxygen, the ozone was gradually absorbed. The experiment is not yet finished, but already one-fourth of the gas in a tube of the capacity of 10 cubic centimetres has disappeared. To produce this effect, the discharge from a machine in excellent order has been passed through the tube for twenty-four hours.

When oxygen is thus converted into ozone, a diminution of volume takes place. The greatest contraction occurs with the silent discharge, and amounts to about $\frac{1}{35}$ of the volume of the gas. The passage of sparks has less effect than the silent discharge, and will even destroy a part of the contraction obtained by means of the latter. If the apparatus be exposed for a short time to the temperature of 250° C., so as to destroy the ozone, it will be found that the gas on cooling has recovered exactly its original volume. This observation proves, unequivocally, that if ozone be oxygen in an allotropic condition, its density is greater than that of oxygen. Experiments still in progress indicate that the density of ozone obtained by the electrical discharge must, on the above assumption, be represented by even a higher number than that deduced by the authors from their experiments on ozone prepared by electrolysis.

When mercury is brought into contact with dry oxygen, in which ozone has been formed by the electrical discharge, it loses to a great extent its mobility, and may be made to cover the interior of the tube with a fine reflecting surface resembling that

of an ordinary mirror. It is remarkable that this great change in the state of the mercury is not accompanied by any further diminution of the volume of the gas. The apparatus employed by the authors would have enabled them to estimate with certainty a change of volume amounting to $\frac{1}{12000}$ part of the whole. On the contrary, on allowing the apparatus to stand, the gas begins slowly to expand; and in thirty hours, when the ozone reactions have disappeared, the expansion amounts to a little more than one-half of the contraction which had previously taken place.

Dry silver, in the state both of leaf and of filings, has the property of entirely destroying ozone, whether prepared by electrolysis or by the electrical machine. If a stream of electrolytic ozone be passed over silver leaf or filings contained in a tube, the metal becomes altered in appearance where the gas comes first into contact with it; but no appreciable increase of weight takes place, however long the experiment may be continued. The volumetric results are similar to those already described in the case of mercury.

Arsenic also destroys dry ozone, but, as it likewise combines with dry oxygen, its separate action on ozone cannot be observed with precision.

Most of the other metals examined, such as gold, platina, iron, zinc, tin, &c., are without action on dry ozone.

Iodine, brought into contact with oxygen contracted by the electric discharge, instantly destroys the ozone reactions, and a yellowish solid is formed: no change of volume accompanies this action.

Peroxide of manganese and oxide of copper have, it is well known, the property of destroying ozone, apparently without limit. The authors have found that these oxides undergo no sensible increase of weight, even after the destruction of 50 or 60 milligrammes of ozone. The same oxides, when brought into contact with oxygen contracted by the spark, restore it to nearly its original volume.

Hydrogen gas, purified with care, and perfectly dry, was not changed in volume by the action either of the electrical spark, or of the silent discharge.

A similar negative result was obtained with nitrogen and the

silent discharge; but with the spark a very slight alteration of volume appeared to occur, the cause of which is still under investigation.

In the experiments now described, the electrical sparks and discharge were always obtained from the common friction-machine. The discharge from the induction coil, even when passed through two Leyden jars, produces very insignificant ozone effects. The heat which always accompanies this discharge, and its comparatively feeble tension, sufficiently explain its want of energy.

All the results recently obtained by the authors fully confirm the former experiments of one of them*, that in no case is water produced by the destruction of ozone, whether prepared by electrolysis or by the electrical discharge. They reserve any further expression of their views as to the true relations which exist between ozone and oxygen, till they shall have an opportunity of laying the results of this inquiry in a more complete form before the Society.—*London Chem. Gaz.* June 1, 1859.

REMARKS ON SPIRITUS AMMONIÆ AROMATICUS.

By MR. C. R. TICHBORNE.

The disparity in composition which the three Pharmacopœias exhibit in this article is greater than at first sight strikes the eye. It is but one of the many cases of dissimilarity presented by these works, which in some of the other preparations must have produced serious results; but *tempora mutantur*. If we compare the methods directed to be followed by the three colleges, we shall find little analogy. Thus, placing them in juxtaposition, we shall find that in about three pints, the formulæ contain respectively—

L. PH.	D. PH.	E. PH.
Rectified spirit Oij. water Oij. } =Oij. } specific } gravity } about .900	Rectified spirits, Oij. ℥iv.	Spirits of ammonia, Oij. ℥xviij. 3v. ℥lvij.
Chloride of ammonium, ℥ij.	Solution of ammonia specific gravity .900 3v. 3ij. ℥xij.	
Carbonate of potash, 3v.	Aromatics in the form of volatile oils, 3v. ℥ij.	Aromatics in the form of volatile oils, 3xviij. ℥ij.
Aromatics in their primitive form, 3xss.	Specific gravity .852.	Specific grav. about .846.
Specific gravity. .918.		

* Philosophical Transactions for 1856, Part I.

We find that the proportions of absolute alcohol run as follows :—L. Ph., about 3xxxijss. ; D. Ph., about 3xxxxjv., and the E. Ph. a little above the latter. The ammonia is in the form of sesquicarbonate in one, and in the caustic form, varying eccentrically, in the other two, whilst the aromatics in the E. Ph. are about equivalent to quadruple those of the London Ph.

In looking over the processes, we find that in the D. Ph. distillation is not used, and although the product is not equal to the other in appearance, I think it has one advantage which ought not to be overlooked—that is, the facility it offers to the Pharmacopolist to make the article for his own use, a consideration to be held in view in all the processes introduced into the Pharmacopœia, so that the apothecary may become more independent of the manufacturer. There are hundreds of Pharmacopolists who make their own articles as far as the appliances go, but are prevented by circumstances from using distillatory or other apparatus. The product of the present Dublin formula is open to serious objections. When first made, it is decidedly colored from the use of a certain oil, which becomes darkened by the action of alkaline substances ; nor is this coloration lessened by the action of the sun's rays, added to which it lacks the sweet saline piquancy gained by the introduction of sesquicarbonate of ammonia. In preparing a formula, such an oil as cinnamon or clove is inadmissible, from its property of becoming tinged when in contact with ammonia ; but by avoiding such oils, we may get a solution which is not only perfectly colorless, but will remain so for an indefinite period. The following, or a similar formula, will give the desired results :—

Rectified spirits, Oj. 3xiv.

Sesquicarbonate of ammonia, powdered, 3ss.

Solution of ammonia, sp. g. .880, 3ij.

Oil of lemon, 3iij.

Oil of nutmeg, 3j.

Oil of lavender, mxx.

Water a sufficient quantity to make Oij.

Specific gravity, .870

Oil of rosemary may be substituted for the lavender, but I think the flavor of the latter would be preferred.—*London Pharm. Journ. July, 1859.*

ON THE RELATIONS OF THE SOIL TO VEGETATION.

By M. BOUSSINGAULT.

From an investigation of the conditions of fertility of the soil Boussingault draws the following conclusions :—

1. That in an extremely fertile soil the amount of nitrogen, although derived from organic matters, and in part still combined in them, cannot be the cause of fertility.

2. That the nitrates and ammoniacal salts are the only compounds which convey assimilable nitrogen to the plant, whether these salts pre-exist in the soil, or are only formed during the progress of cultivation.

3. That a plant, in order to be capable of its normal development, must have a very great volume of earth at its disposal, because the amounts of nitric acid and ammonia, which are contained in a given volume of soil, are very small.

4. That the analysis of a soil as to its amount of nitrogen cannot serve as the foundation of any opinion as to its fertility, because it gives the amounts in an assimilable form together.

5. That when the soil is lying fallow, a considerable quantity of the carbon of the organic matters which it contains is lost, but that the amount of nitrogen does not diminish but increases. Whence this increase arises, whether it is caused by nitrification, or by the production or absorption of ammonia, is still to be ascertained.—*Chem. Gaz.*, July 15th, 1859, from *Comptes Rendus*.

CANOUIL'S PROCESSES FOR MANUFACTURING CHEMICAL MATCHES WITHOUT PHOSPHORUS AND CONTAINING NO POISONOUS SUBSTANCE.

1. *Mass without Phosphorus for Sulphured Matches.*

The matches without phosphorus manufactured in Paris by Canouil, are ignited by rubbing upon any hard body, whether it be rough or smooth supposing the surface against which they are rubbed to present a certain amount of resistance.

Neither a blow, nor a shock, nor a temperature of 356° F. are capable of igniting these matches ; their combustion is only caused by friction.

As the mass contains no phosphorus, their manufacture presents no danger for the workpeople, as they neither cause explosions, nor injurious emanations. The mass of these matches, which were patented in France in March 1857, contains the following substances :—

Dextrine	10 parts.
Chlorate of potash	17 “
Brown oxide of lead	35 “
Iron pyrites	35 “
Water, the quantity necessary to form a uniform paste.	

The chlorate of potash, the oxide of lead, and iron pyrites are separately powdered, and then made into a paste by means of the solution of dextrine ; into this the ends of the sulphured matches are dipped in the usual way.

The dextrine might be replaced by gum or glue, and the iron pyrites by other metallic sulphurets, to some of which, however, it is preferable as not being poisonous.

2. *Safety-matches with a peculiarly prepared Friction-surface.*

A second patent of Canouil's, dated October 7, 1857, relates to safety-matches of wood, wax paper, German tinder, &c., which ignite only at a particular surface, containing no phosphorus. The latter consists of a slip of wood, card, or metal, covered with a layer of the preparation, which causes the ignition of the chemical matches by mere friction. Such matches may be sent anywhere without the least danger, as the matches and the friction-surfaces may be packed in separate boxes. The mass for the matches consists of—

Chlorate of potash	5 parts.
Acetate of lead	2 “
Bichromate of potash	2 “
Flowers of sulphur	1 “
Gum or dextrine	6 “
Water	18 “

The covering for the friction-surface consists of—

Iron scales	1 part.
Emery	1 “
Chlorate of potash	6 “
Minium	1 “

Size, a sufficient quantity to form a paste, which is applied to a slip of card, wood or metal.

The substances in both formulæ are made into paste, described for the first matches.

3. *New Mass without Phosphorus for Sulphured Matches.*

In order to avoid the slight explosions which occur on the friction of the first matches, the discoverer now leaves the metallic sulphurets or the sulphur out of the composition. They are replaced by powdered glass or flint, which is mixed in various proportions with the chlorate of potash, according as it is desired to produce combustion with more or less ease by friction. Bichromate of potash is also added as an oxidizing body.

The new mass of sulphured matches consists of—

Chlorate of potash	5 parts.
Powdered glass or flint	3 “
Bichromate of potash	2 “
Gum or dextrine	2 “
Water	8 “

London Chem. Gaz. June 1, 1859, from Dingler's Polytechn. Journ.

ON ANTHEMIN AND ANTHEMIC ACID.

M. Pattone, Pharmacien of the civil hospital of Alexandria, (*Journ. d'Anvers*), states that the common chamomile of Europe (*Anthemis arvensis*) contains a crystallizable alkaloid, *Anthemin*, and an organic acid. Anthemin is obtained from the flowers, which are placed in a still with sufficient water, and the aromatic oil distilled off. The residue is then expressed strongly, the decoction evaporated to an extract, and this exhausted with boiling alcohol, of 85 per cent., which dissolves out a resinous matter and an acid. The undissolved residue is then treated with boiling distilled water, filtered, and when cold, ammonia is dropped in until the liquid has a decided alkaline reaction. After a little while it deposits beautiful brilliant prismatic crystals, which, after twenty-four hours, are removed, and washed with cold water.

This substance has neither odor nor taste; it is sensibly alka-

line, very little soluble in cold water, a little more in boiling water, insoluble in alcohol and ether, very soluble in acetic acid, carbonized by heat alone, and by hot sulphuric acid.

Anthemic acid is prepared from the alcoholic liquid obtained in the process for anthemin, which is evaporated to an extract; this treated with distilled water, and the aqueous liquid filtered and saturated with caustic baryta. The liquid is now heated to ebullition, filtered, and diluted sulphuric acid carefully dropped in, to precipitate the baryta, avoiding an excess. The liquid filtered from the sulphate of baryta is evaporated to dryness and exhausted with ether, which is allowed to evaporate spontaneously, and yields prismatic crystals, contaminated with extractive matter. These crystals have a decided bitter taste, and the odor of chamomile; they redden strongly litmus paper, are soluble in water, alcohol and ether, and entirely insoluble in benzine. The author intends extending his researches to the Roman chamomile *Anthemis nobilis*.

OBSERVATIONS ON THE SPECIES OF NICOTIANA.

By DR. JOHN LE CONTE.

The great variety of tobacco met with in commerce, differing in color, in flavor, and in strength, does not depend upon a difference in species or variety, but almost entirely on the soil in which it has grown, in the method of curing it, and the adulterations which it undergoes in passing through the hands of unscrupulous dealers. Thus manured land never produces the plant of the first quality; for this purpose, a virgin soil, very rich and strong, with but little calcareous matter, is required. This, however, will not endure for a longer space than six years: it gradually deteriorates, until at last it is entirely worn out, and cannot be brought back to its original state by the application of manure. This always renders it disagreeably strong, and highly impregnated with nitre. Calcareous soils produce these same effects, and thus the tobacco of our Western States is inferior to the Virginian and may easily be known by a saline taste. If tobacco be cured without the use of artificial heat, its fine flavor is better preserved, and its color more uniform. Again, if dried with little exposure to the air, it becomes of a

bright yellow color. The best tobacco for smoking comes to us from the tropics, possessed of a peculiar flavor and perfume; this was once the case with all the segars brought from Cuba. At present, those that are introduced into the United States from that island are adulterated with tobacco of an inferior kind; they are not at all like those brought fifty years ago. Either the plant has deteriorated by mixing with other species, or is so adulterated by a mixture with the common tobacco of our country, that the true flavor is entirely lost. Vessels loaded with tobacco, the produce of our own soil, are constantly leaving our shores for the port of Havanna. Besides, large quantities of an inferior quality produced from imported seed are now sent from New England, and either used there or brought back and sold here as genuine Havanna. The last good tobacco that I have smoked was made by myself in Georgia, about thirty years ago. This possessed the delightful perfume peculiar to the best raised within the tropics; it was at the same time very mild and burnt freely. There is, however, much imagination in the judgment which we form of tobacco.

I might here point out the method by which deleterious substances are mixed with tobacco, and how the leaves of various other plants are substituted for it. Some of the most extensively used manufactured tobacco has poisonous drugs mixed with it, which increases its action on the system, particularly on the brain, in such a degree as to become really dangerous. Those persons, therefore, who use it for a masticatory, would do well to employ no other than the pure leaves as they are brought from Virginia. Almost all the pressed tobacco is defiled with liquorice or molasses, which substances conceal the bad taste of the inferior qualities. The method by which the flavor of our plant is imparted to plants which have none of their own is as follows:—A quantity of the refuse tobacco is boiled in wine, or more frequently in human urine, until a strong fluid extract is obtained; to this some salt is added. It is then poured upon the dried leaves of other plants, such as rhubarb, burdock, sunflower, cabbage, or broad-leaved dock, which, after remaining in the fluid a sufficient time to absorb as much of it as they can contain, are hung up to dry, and then made into Havanna segars. Cut tobacco, likewise intended for smoking, is mixed

with the leaves of stramonium and foxglove, and with opium. There is, however, no end to the dishonesties practised by tobacco manufacturers.

I now proceed to describe the plant as it has come under my observation, premising that I do not believe that the species here noted are any where to be found in a perfectly wild or native state. Mr. Lehman, the last authority on this subject, enumerates twenty-one species. I have seen but four, and one of these looks very much like some other genus. I allude to *N. quadrivalvis*. The other species of *Nicotiana* have but two valves in the capsules. The three remaining species, I know from experience, mutually mix together. I omit a description of the genus.

NICOTIANA TABACUM. Annual, viscid, branching. Leaves oblong lanceolate, broad, acuminate, most entire, for the most part strictly sessile, at the base more or less decurrent, subamplexicaul. Flowers paniculately corymbose, terminal, with linear lanceolate bractes. Calyx oblong, five-cleft, the divisions lanceolate acute. Corolla infundibuliform, much longer than the calyx, the tube viscid, greenish, the limb pale rosy, spreading, the lobes ovate acute, capsule a little longer than the calyx, stigma transversely sulcate on the top.

This is the common tobacco of commerce, called by different names, Virginian, Kentucky, Nagadoches, &c. It is not agreeable to smoke, unless weakened by washing in water. It is the only kind fit for chewing. Too much care cannot be taken in the operation of curing it, and much of its goodness depends upon the manner in which it has been dried and fermented. The Indians in this country are in the habit of mixing it with the leaves of *Rhus glabrum* and *Laurus Borbonia*, or the scraped bark of *Cornus sanguinea*, all of which improve its taste in a remarkable degree.

N. FRUTICOSA. Perennial, pubescent, viscid, branching.—Leaves lanceolate, acuminate, most entire, sometimes very shortly petiolate, most generally sessile, the lower ones amplexicaul. The inflorescence the same as of the preceding, stigma subbilobate.

This is the far-famed tobacco of the Island of Cuba and of all the tropical parts of America. I have been told that it is the

species cultivated in the interior of Africa. It is probably indigenous to that portion of the globe. An African, from a region in that country, far distant from the sea, who was well acquainted with the cultivation of the plant in his own country as well as in this, told me when he first saw this species growing in Georgia, that it was the kind which grew in his country. He could not well be mistaken, for the leaves of *N. tabacum* are very wide, whilst on the contrary of the *N. fruticosa* they are rather narrow. It is from this species that the so-called Havanna segars ought to be made. But it seems to me that very little of it enters into the composition of what we now receive from Cuba.

N. RUSTICA. Annual, villous, viscid, branching. Leaves petiolate, ovate or roundish obtuse, most entire, sometimes more or less cordate, divisions of the calyx short, ovate or roundish. Corolla greenish yellow. Stigma entire.

From this species, which is nearly as agreeable for smoking as the last, are produced the varieties called Turkish, Chinese, East Indian, Shirazian and Latakia tobacco. It is said to have been imported from America into England in the year 1578, and yet has never been seen here except cultivated as a curiosity in gardens, the seed being always brought from China. It must be considered as a species confined originally to the older continents, and not known on this side of the Atlantic, until after the discoveries of Columbus and others. I think that I have seen it growing in a quasi indigenous state on the road sides in Europe. No tobacco has ever been seen growing without cultivation in the United States. This circumstance taking place with most of our cultivated vegetables is a certain proof of their having been imported from some other country.

As has been observed before, these three species will mix together in every possible degree, hence the great number of species which appear in our books. If we take the trouble to analyse these, it can easily be perceived that they have been produced by hybrid intermixtures, unless fertile hybrids are to be considered as valid species. All those which resemble the *N. tabacum*, but with narrower leaves than common, or in any degree possessed of the peculiar characteristics of the *N. fruticosa*, have been produced by the mixture with this species, and all of

those with leaves more or less petiolate, whether lanceolate or ovate, as formed by a combination of *N. tabacum*, *N. fruticosa* and *N. rustica*. It is remarkable what strange appearances these will put on; every possible variation of the principal forms and every gradation of position will be found, all, however, easily reducible to the three original types.—*Proc. Acad. Nat. Sci.*

THE CINCHONA TREE.

The following interesting letter contains some valuable information to persons in this country, which will be enhanced by the knowledge that Mr. D. Jay Browne, of the Agricultural Bureau of the Patent Office, has taken the initiative steps to procure seeds, and will distribute them in the various parts of the country for experimenting. It is from the bark of this tree that the celebrated tonic, known as quinine, is obtained. It is now almost an indispensable article in medical practice:

U. S. Legation, Quito, Ecuador, }
January 16th, 1850. }

Dear Sir,—The great importance which has become attached to the cinchona tree, which furnishes the Peruvian or fever bark, will excuse me for troubling you with this communication. I do not know whether attempts have been heretofore made for its propagation in the United States or not, but there can be no doubt that some parts of our country are adapted to its cultivation.

It is found in Ecuador, as well as in Peru, Bolivia, and New Granada, and its value as an article of commerce has very greatly increased during the last half century. In this country it formerly sold at \$40 per hundred, while its present price is \$1 per pound. (These prices are in Ecuadorian currency, to reduce which to United States money requires a reduction of about one-fifth.) In Ecuador the tree is found at elevations of from six to eight thousand feet, and where the temperature ranges from 60 to 66°. But as Humboldt observes, a comparison between the climate of these regions and others is not satisfactory, and it does not follow that the tree will not flourish in

temperatures quite different. Within a few years, seeds of the tree have been sent to England and propagated in order to be forwarded to India. The plants have been forwarded thither in glass covered boxes, with what success remains to be seen. The seed is diminutive, and may be sent by post to remote countries. In northern Ecuador, and west of the mountains, and of Quito, the inferior kind is found.

The red bark variety, which is most valuable, is everywhere becoming scarce before the depredations of the hunters, and as no care is exercised in its cultivation, it may, after some years, unless attention is turned to the subject, become nearly extinct. The most valuable and extensive forests of the tree are found in southern Ecuador, in the vicinity of Loxa, and it is from that quarter, so far as this country is concerned, that supplies are drawn. Information regarding the cinchona tree may be found in Humboldt's Personal Narrative, volume 1, page 138, and more particularly in his Views of Nature (Bohn's Translation of 1850), pp. 280, 390, and (in note) 442.

It may be well for you to bring this subject to the attention of Mr. D. Jay Browne, connected with the Patent Office, and I should be glad to hear from him concerning it. From my position here, I enjoy peculiar facilities for obtaining the seeds of the tree, and information regarding its culture, and will be glad to act in concert with Mr. Browne, if he will take efficient steps for its introduction into the United States.

Very truly yours, C. R. BUCKALEW.

It is stated that about double the amount of quinine can be obtained from the bark in its green state than when dried.—*Louisville Med. News, July, 1859.**

* [Mr. Buckalew is probably mistaken as to the advantageous culture of cinchona in this climate. It is true the tree grows in so elevated a position as to have a moderate annual temperature, but it must be recollected that this temperature in a tropical country is nearly constant. Besides, even in its native country, cinchona ceases to yield the alkaloids, in advantageous proportions, below a certain altitude. All the attempts to transplant cinchona, so far as we know, have been to intra-tropical countries, except the proposed French experiment in Algeria.—ED. AM. JOUR. PHARM.]

CHLORINATED LUNAR CAUSTIC.

BY HENRY N. RITTENHOUSE.

In a previous number of the Druggist, was an article with the above heading, by Dr. J. Lawrence Smith, of Louisville, (from the *Medical News*,) in which he suggests the addition of chloride of silver, for the purpose of giving it strength and lessening its solubility. I have tried his formula several times, also that proposed by Dr. Squibb, for the same purpose, but without success in obtaining the desired strength of the sticks, when using pure chloride of silver, but with the use of chloride of sodium as first suggested, I have never failed in obtaining a desirable article. It is not nitrate of soda that is necessary for success?

As far as the therapeutical effects are concerned of fused nitrate of silver, I cannot see any objection to the small quantity of nitrate of soda present; and when properly labelled as it should be, and sold for what it really is, what objection is there to using chloride of sodium, if it is really an essential?

POWDERED BLUE MASS.—I offer for the benefit of your readers, the following formula for powdered blue mass, which I have found after repeated trials, to furnish a satisfactory product.

Take of Mercury,	1 oz. Troy.
Pulv. Liquorice Root,	$\frac{1}{2}$ oz. "
Pulv. Rose Leaves,	ʒi.
White Sugar,	1 oz ʒʒ.
Water,	f.ʒij.

Mix half an ounce of sugar and two drachms liquorice root in a mortar, add the mercury, then the water gradually; triturate the materials rapidly, until the mercury is extinguished, (which can be readily done in five minutes), then add the remainder of the ingredients, and mix thoroughly, spread the damp powder upon paper for a few hours to dry. Powder and sift it. This formula has the advantage of producing a preparation identical with the Pil. Hydrarg. of the U. S. P., in composition and strength, and is easily prepared.—*The Druggist.*

Varieties.

Tooth Paste.—The best plastic tooth paste is made in the following way: 1. 1 part finely powdered glass is mixed with 3 parts finely divided oxide of zinc entirely free of carbonate. 2. 50 parts of solution of chloride of zinc, spec. grav. 1.5 to 1.6, is mixed with 1 part of borax dissolved in the smallest possible quantity of hot water; all parts are taken by weight.

If it is to be used for filling teeth, the powder No. 1 is mixed with a sufficient quantity of the solution No. 2 to make an even paste; during the operation the mass generates a moderate heat.

The addition of powdered glass is necessary to impart to the mass the requisite firmness. On adding the solution of borax to the solution of chloride of zinc, a precipitate of borate of zinc is at first produced, which, however, easily dissolves in the excess of the zinc solution. Borax acts by delaying the hardening and subsequently to increase the hardness of the mass; without addition, the paste hardens so quickly as to leave scarcely time to mould it into the required shape.

This paste is of a dazzling white, which is never met with in teeth, and it may be therefore advisable to mix No. 1, previous to adding the liquid, with a small quantity of ochre. In one day the mass has become so hard as to require considerable force to break it up; its ultimate hardness is that of marble; it is not affected by water, and may perhaps be found useful for other purposes where a plastic mass is required.—*Pharmac. Zeitung.*—*Schweiz. Zeitschr. f. Pharm.* 1859, 16.

J. M. M.

Parisian Wash Powder.—The ladies' toilet table has been enriched by the "Parisian Wash Powder," which is prepared in the following manner: Rice is softened in pure water, which is daily replaced by fresh water until the rice can be easily mashed; all the water is then drawn off, the rice crushed, the pasty mass mixed with water to a milky liquid, and this brought on a sieve or a cloth which must not be too thick. After settling, the fine powder is collected, dried, and a small quantity of soda added.—*Schweiz. Zeitschr. f. Pharm.* 1859, 49.

Mr. Fox Talbot's New Discovery.—*Phototypic Engraving.*—The subject of engraving steel or copper plates by means of photography, is one which has deservedly attracted the attention of the leading men of science, both in this country and on the Continent. . . . We have been favored with the inspection of some new photographic—or, to speak more correctly

photoglyphic engravings, executed by a new process, the result of experiments made by Mr. H. Fox Talbot. By means of his invention, common, paper photographs can be transferred to plates of steel, copper or zinc, and impressions printed off afterwards with the usual printer's ink. . . . The plates engraved by this mode are indeed beautiful in themselves as photographs, and will bear strong microscopic inspection, the most minute detail being given with astonishing fidelity. . . . We are as yet not permitted to give publicity to the details of the process, but we can say that the scientific facts upon which the process is based are among the most striking in photography, which, as our readers are aware, is an art fertile in singular novelties. The specimens which Mr. Talbot has favored us with of this new branch of art are very beautiful. They are free from many of the imperfections which were so evident in former attempts, and the manner in which the half-tones are given is really wonderful; the specimens are of various subjects, showing the perfection which can be obtained in any branch of pictures. Even in these copies the detail is so fine that when a powerful microscopic power is brought to bear on them, we are enabled to trace the names in the shops in the distance, and easily read the play-bills in the foreground, and this in a picture only a few inches square, while the minuteness in architectural subjects is most remarkable. In a view of Paris, there is all that can be desired in half-tones, and the perspective is almost as good as in a photograph.—*London Chemist, from the Photographic News.*

Poisonous Effects of the Leaves of the Yew-Tree.—That the leaves of the yew are of pernicious influence was known to the Greeks and Romans, and confirmed by later authorities. The yew-tree itself may cause vertigo, lethargy, and even drunkenness, by the narcotic exhalation which it emits. We now read, in the *Journal des Landes*, that three horses belonging to the squadron of cavalry stationed at Mount de Maison, died there suddenly, a few days ago, and that on dissection, it was found that they had been eating plentifully of the leaves of some yew-trees; the coats of of the stomach evinced marks of the deleterious effects produced by this poison.—*lb.*

Dangerous Explosion of Muriatic Acid.—The *Wheeling (Va.) Times* of the 15th inst., says: Yesterday morning, about two o'clock, a carboy containing sixty-seven pounds of muriatic acid, exploded in the drug store of Mr. Fundenberg, under Washington Hall. Mr. Allen Fundenberg, who sleeps in the store, received the first intimation of the accident by finding a great difficulty in breathing, which increased so fast that he sprang out of bed and started to the front door. On the way he stepped in the acid where it had run over the floor, and so powerful was its effect that the skin on the bottom of his foot was left sticking to the floor. He opened the

door and dragged the carboy into the street, where it shortly took fire spontaneously, and burnt with a bright blaze until every vestige of the can and acid was consumed. The effect of the vapor arising from the acid is visible on everything about the store. The color of the paint is turned, all the paper labels are discolored, and a couple of tin oil tanks are covered with a very pretty representation of frost-work. The floor where the acid ran has been turned a good cedar color, and the iron work in front of the store is rusted to perfection.—*Cincinnati Eclectic Journal*.

Dental Anæsthetic.—Tincture of aconite, one ounce; chloroform, one ounce; alcohol, one ounce; morphine, six grains. Mix. To prevent the pain of extraction, and destroy sensibility in the gums by local application, moisten two pledgets of cotton with the liquid, and apply to the gums, for a minute or two, over the tooth to be extracted.—*Dr. Test—Jour. of Materia Medica*.

Voltaic Narcotism.—Dr. B. W. Richardson, Professor of Physiology at the Grosvenor School of Medicine, has, by using electricity combined with a narcotic, succeeded in inducing local anæsthesia. He applies a narcotic solution, consisting of equal parts of chloroform and tincture of aconite, to the part in which he desires to produce anæsthesia; then covers this part with a plate connected with the positive pole of the voltaic battery, and applies the negative pole to an adjoining part. Dr. R. in this mode produced anæsthesia in a nævus on the back of an infant, when Dr. Halford transfixed and tied a ligature around the nævus without the infant giving any indication of suffering pain by the operation.—*Virginia Med. Jour.*

The Ginseng Excitement.—The newspapers having teemed of late with paragraphs concerning an unusual excitement among the citizens of Minnesota, who were turning out "*en masse*" to dig the roots, it occurred to us that, having subscribers in the Ginseng district, we might obtain reliable information from them; and the result of addressing one of them is embodied in the following letter:

Faribault, Rice Co., Minnesota, July 1st, 1859.

Mr. Frederick Stearns: Dear Sir,—Yours of the 16th of June was duly received. In that letter you request me to give you some statistics, commercial and otherwise, of Ginseng; and, in answer, would submit to you the following:

It is found only in timbered land, selecting such soils as produce the Sugar Maple, Basswood, Butternut, and Black Walnut, and where the surface of the land is rolling or undulating. Such lands in our State are not generally very heavily timbered.

That portion of our State where it is most to be found is in what are termed the *Big Woods*, lying between the town of Faribault on the east,

and the South Bend of the St. Peter's River on the west, and from that line extending down the river in the direction of St. Paul's. The distance across this timber from Faribault to Mankato is about forty miles; but as you pass down the river it grows narrower, and disappears altogether near the town of Shacopes, some thirty miles above St. Paul's. It is not all over this piece of timber that the Ginseng grows, but only on such portions as are above indicated, and these will not comprise but about one-fourth part where it will grow in sufficient quantity to make it profitable to gather it.

The points at which it has been carried on chiefly, are Faribault, Mankato, and St. Peter's. Small places in the timber, and on the St. Peter's River, have done something, but these principally.

The root is dug, and carried as dug, to a particular point, chosen for its convenience, where it is properly washed and dried. Some have steamed the root, and then put it on trays in a tight room, where the thermometer ranges from one hundred to one hundred and twenty; while others lay them on a scaffold for several days, in the sun, and then finish them in the dry-house.

The first look the handsomest, and I think command the highest price in the market, while, to my mind, the latter method leaves the root in its most natural state. The green root has commanded prices varying from six to ten cents, and in a few instances even more—the average being about eight cents. It has taken from four to four and a half pounds of the green root to make one of the dry, but I am told that in the fall of the year it takes only about three.

The amount of the dried root that has been shipped from this place, as near as I can learn has been between twenty-one and twenty-two thousand pounds, and that sent from different points along the St. Peter's to St. Paul, to be shipped, has not exceeded eighteen thousand. The time spoken of the shipment from St. Paul was about the 20th of last month.

I am informed that it has been found in the vicinity of Crow River, some distance above St. Paul, but have not learned to what extent. Up to the time spoken of there had been no shipment made of Ginseng from that locality, and the presumption is that the amount will be small.

The expectations of large shipments being made to the cities on the seaboard has had the tendency to depress the market price there, and that in turn has had the effect to entirely stop the trade throughout the State. Every town, large or small, in the vicinity of those locations where it grew, were more or less engaged in it; but since the news of the price having declined reached us, every operator has declined buying, and no more roots are brought into the market.

The larger share of the roots prepared for market have been shipped; and should the price continue as it is, very little more will be collected and dried for shipment.

This is as fair a statement as I can give; and you may make such use of it as you may think best.

Most respectfully yours,

W. H. STEVENS, M. D.

Ginseng is very abundant throughout this State, and there is no reason why it should not be profitably collected at present ruling rates. It is unfortunate for the Minnesotians that they chose the wrong season to collect it, as it should not be dug until after the blossoming and ripening of the seed of the plant—say from August to October.

The most sensible method of curing it would be in the open air, but under shade.—F. S. *Peninsular and Indepen. Med. Jour.*, Aug., 1859.

Poisoning by Cyanide of Potassium.—At a late meeting of the New York Pathological Society, Dr. Finnell presented a specimen of a stomach removed from a patient who was poisoned by cyanide of potassium. The patient was a Daguerrean artist. He swallowed a piece of salt as large as the end of the finger. Immediately he cried for water, but before he could get his mouth to the pipe of the hydrant, he died. Death took place in from three to five minutes after he swallowed the poison.

In answer to a question from Dr. Clark, he stated that the symptoms of poisoning by this salt were very like those from poisoning by prussic acid. The death was very rapid. This was the third case he had met with. This man lived but three minutes, another lived twelve minutes, and a third, he was not certain how long he survived; it was a very short time, however. In each of the cases the stomach was intensely reddened.

Dr. Dalton thought it was important to know that injection of the stomach took place in so short a time as three minutes, unless most of the change was post-mortem.—*Nashville Monthly Record*.

Vivianite.—M. Schiff has proved, by chemical analysis, that the blue color which pus sometimes presents is owing to phosphate of iron in an amorphous state. It is this same salt which gives the blue color to animal remains which have been interred for a long time. The demonstration of this fact is owing to M. Nickles, who has found in human bones phosphate of iron crystallized in the form peculiar to the vivianite of mineralogists.—*Ibid*, from *North American Medical and Chirurgical Review*.

Adulteration of Valerianate of Iron.—The valerianates are often adulterated, the adulteration consisting of the mixture of some salt with a certain quantity of essential oil of valerian. M. Monnerat has given some easy methods of detecting these adulterations. He found the false valerianate had a deeper color than the true, and that it was insoluble in alcohol and ether, and that, when treated with boiling water, it gave, after cooling, a deposit of subcarbonate of iron, and a considerable quantity of essential oil of valerian floating upon the surface of the liquid. Besides, the true

valerianate of iron is insoluble in water, but on the contrary, is entirely soluble in alcohol. Another character of the true valerianate is its acid, disagreeable, persistent smell, which is very different from the penetrating odor of valerian presented by the false valerianates formed by the addition of the essential oil of the plant.—*The Druggist*, June, 1859.

Acetous Tincture of Cimicifuga.—Dr. Köhler, of Pennsylvania, proposes the employment of dilute acetic acid and alcohol as a solvent for the active matter of this valuable indigenous drug, as follows:

Take of black cohosh root, bruised, five ounces; dilute acetic acid, U. S. P., one fluid ounce; alcohol, eight fluid ounces; water, eleven fluid ounces. Mix, macerate fourteen days; express and filter. Dose, one to two teaspoonfuls.

He says: "After due trial I found this combination to answer better than any other form, and the neighboring physicians, to whom I gave the formula, express themselves as highly pleased with the acetated tincture of cimicifuga. It has been successfully employed in nervous affections, and as an alterative in various forms of rheumatism and uterine affections.—*Cin. Lancet and Observer*.

Prohibition of Empirical Preparations in Russia.—The Russian government has issued the most stringent orders to refuse admission at the various custom-houses to the following substances: 1. Colloidum cantharidale. 2. Hydrargyrum zooticum. 3. Morrison's pills. 4. Oleum harlamense. 5. Hydrargyrum sulphuratum stibiatum. 6. Leroy's medicines. 7. Ferum limatum alcoholisatum, and Revalenta Arabica. 8. Lactate of iron lozenges. 9. Essential coffea. 10. Extractum filicis maris æthereum. 11. Theriac. 12. Extracta medicinalia. This is a very wise regulation, excluding, on the one hand, dangerous quack medicines, such as Morrison's and Leroy's, and on the other, preventing the credulous from investing their money in such preparations as the Revalenta Arabica.—*Med. Zeit. Russlands, and Virg. Med. Jour.*, June, 1859.

AMERICAN PHARMACEUTICAL ASSOCIATION.

The Seventh Annual Meeting of the "American Pharmaceutical Association," will be held in the city of Boston, Mass., on Tuesday the 13th day of September next at 3 o'clock P. M.

The objects of the Association and the conditions of membership are explained in the following extracts from the Constitution.

ARTICLE I.

This Association shall be called the American Pharmaceutical Association. Its aim shall be to unite the educated and reputable Pharmacutists and Druggists of the United States in the following objects:

1st. To improve and regulate the drug market, by preventing the importation of inferior, adulterated or deteriorated drugs, and by detecting and exposing home adulteration.

2d. To establish the relations between druggists, pharmacutists, physicians and the people at large, upon just principles, which shall promote the public welfare and tend to mutual strength and advantage.

3d. To improve the science and the art of Pharmacy by diffusing scientific knowledge among apothecaries and druggists, fostering pharmaceutical literature, developing talent, stimulating

discovery and invention, and encouraging home production and manufacture in the several departments of the drug business.

4th. To regulate the system of apprenticeship and employment so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing and selling medicines.

5th. To suppress empiricism, and as much as possible to restrict the dispensing and sale of medicines to regularly educated druggists and apothecaries.

ARTICLE II.—*Of the Members.*

Section 1. Every pharmacist or druggist of good moral and professional standing, whether in business on his own account, retired from business or employed by another, who, after duly considering the objects of the Association and the obligations of this Constitution, is willing to subscribe to them, is eligible to membership.

Section 2. The mode of admission to membership shall be as follows: Any person eligible to membership may apply to any member of the Executive Committee, who shall report his application to the said Committee. If after investigating his claims they shall approve his election, they shall at the earliest time practicable report his name to the Association, and he may be elected by two thirds of the members present, on ballot. Should an application occur in the recess, the members of the Committee may give their approval in writing, which, if unanimous, and endorsed by the President, shall constitute him a member, and the fact be reported to the Association at the next succeeding meeting.

Section 3. No person shall become a member of this Association until he shall have signed the Constitution, and paid his annual contribution for the current year. All persons who become members shall be considered as permanent members, but may be expelled for improper conduct by a vote of two-thirds of the members present at any annual meeting.

Section 4. Every member shall pay into the hands of the Treasurer the sum of two dollars as his yearly contribution, and is liable to lose his right of membership by neglecting to pay said contribution for three successive years. Members shall be entitled, on the payment of three dollars, to receive a certificate of membership signed by the President, Vice-President and Secretary, covenanted to return the same to the proper officer on relinquishing their connection with the Association.

Section 5. Every local Pharmaceutical Association shall be entitled to five delegates in the annual meetings, who, if present, become members of the Association, on signing the Constitution, without being ballotted for.

JOHN L. KIDWELL, President.

Georgetown, D. C., June 25th, 1859.

Editorial Department.

MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—It is presumed that Pharmacentists generally are by this time aware that the Association meets at Boston on the 13th of September. From the indications so far apparent, we believe the meeting will be large and interesting. The time is a favorable one for travel—the season of fruits—of abundance. Our Boston friends are wide awake, as the following circular from the Treasurer will evidence, and their proverbial hospitality and attention to strangers will not be wanting on this occasion.

Boston, August 13, 1859.

Members are requested to forward the names of their friends whom they wish to propose for membership, so that they may be elected at the first session of the next meeting.

Members will confer a favor by notifying the Treasurer of the decease of any member during the last year.

Any specimens for exhibition may be forwarded to the care of CARTER, COLCORD & PRESTON, Boston.

The next meeting of the Association will be held on the second Tuesday of September, (13th,) 1859, at 3 o'clock, P. M., at the rooms of the MASSACHUSETTS COLLEGE OF PHARMACY, Perkins Building, Temple Place, Boston, Mass.

Ample accommodations will be secured at the AMERICAN HOUSE, so that all who attend can be at one hotel, with table and accommodation room appropriated solely for their use. Those who attend with their families, will find retired apartments in the same hotel; or, if desired, in boarding houses or private families.

All members, and persons intending to become members, are requested to report themselves at the rooms of the College, and at the hotel.

From the manifestly increasing interest in the Association, a large attendance is expected, and it would be very gratifying to meet every member, and all Pharmacutists who are interested in our objects.

S. M. COLCORD, *Treasurer*.

Although not required by the rules of his office to do so, it is highly commendable in the Treasurer to give this information appended to the bill for annual subscription. It suggests a rallying point for the members, who thus are able to learn who have arrived. Members should encourage their pharmaceutical friends who are not members to make the trip to Boston and join the Association. Those who want information as to the conditions of membership, will find them in the President's notice at page 483 of this number.

ST. LOUIS PHARMACEUTICAL ASSOCIATION.—The following note to the editor announcing the names of Delegates from the St. Louis Association is published by request:

ST. LOUIS, Mo., 18th August, 1859.

DEAR SIR:—I forward to you the names of the Delegates of the "St. Louis Pharmaceutical Association" to the annual meeting of the "American Pharmaceutical Association," to be held in September; would you be kind enough to insert their names in the next issue of your valuable journal? The delegates are—Messrs. Enno Sander, William H. Dornin, James O'Gallagher, Samuel D. Hendel, and William B. Parker.

I remain, dear sir, respectfully yours,

JAMES O'GALLAGHER,

Corresponding Secretary St. Louis Pharm. Association.

PHILADELPHIA COLLEGE OF PHARMACY.—The School of Pharmacy in this Institution will open its courses, the approaching session, on Monday, October 3d, at 7½ o'clock, P. M., at the College Hall, Zane Street above Seventh, on which occasion, Prof. R. P. Thomas will deliver the general Introductory. By consulting the advertising columns, our readers will find a programme of the Lectures and Conditions of Graduation, etc.

THE PHARMACEUTICAL SOCIETY OF GREAT BRITAIN.—This Society, in the death of its President, Jacob Bell, has met with a loss that will long be felt by its members. It would be difficult to find in the annals of any Society a more devoted and untiring friend and officer. Through good

report and evil report, under all circumstances that have occurred to retard or annoy its progress, Jacob Bell has always been at his post, and always equal to the emergency. He had the satisfaction of living to see the Society highly prosperous and firmly established, and the internal jealousies, which at one time threatened to rend it in twain, to disappear. It is pleasant to find that he was appreciated whilst he lived, and from Aberdeen to Plymouth the members of the Pharmaceutical Society remember him with love and respect.

At the meeting of the Council, held July 6th, 1859, after an expression of grateful remembrance of the services of Jacob Bell, it was

"Resolved, That a Committee be appointed to take the requisite steps for forming a Capital Fund, out of which one or more Scholarships, bearing the name of Jacob Bell, may be established in connection with the Society." A committee was appointed to carry it out.

On the same occasion, the Council were advised of the following extract from the will of the late President:

"I give and bequeath the sum of two thousand pounds [\$10,000] to the Trustees for the time being of the Pharmaceutical Society of Great Britain, which two thousand pounds are to be paid exclusively and in priority to other legacies, out of such part of my personal estate as is by law applicable to such payment, and to be expended in establishing or otherwise increasing the efficiency of a School of Pharmacy, or in promoting pharmaceutical education, in such manner as the Council of the said Society may deem expedient, but so that the receipts of the Trustees shall be good discharges to my executors."

The Council, by resolution, pledged themselves to carry out the expressed wishes of the testator to the best of their ability.

At the same meeting an election was held to fill the vacant Presidency; whereupon it was declared that Mr. T. N. R. Morson was duly elected to that office. At the meeting held on the 20th of July, Mr. Peter Squire was elected to fill the Vice-Presidency rendered vacant by the election of Mr. Morson.

THE ADULTERATION OF CREAM OF TARTAR.—Now that cream of tartar has become an article of the *cuisine*, the larger part used being as a substitute for yeast in bread and cake making, the rascals who are constantly seeking out some means of cheating the public, have laid hold of this, disregarding the fact that it had already suffered sufficiently among the druggists. The following note reveals a specimen of this villainy, which exhibits some acuteness, as the party addressed himself to a class who either ignorantly or from habit would be induced to accept the bait :—

Philadelphia, August 22d, 1859.

To the Editor of the American Journal of Pharmacy :

The sample, is part of a specimen of an article which was offered in our

market within the past fortnight, under the name of "Cream of Tartar Adulterator." The parties offering it for sale do business in New York, as dealers in spices and grocery articles. The article was not offered to the wholesale druggists, but to spice and drug grinders in this city, at from 5 to 8 cents per lb.

An examination of the article shows it to be sulphate of lime, containing a little sulphate of soda. Under the glass it has the appearance of translucent gypsum ground to a similar fineness as cream of tartar. It presents near the same appearance as cream of tartar of a damp powder, with points reflecting light, though the color is whiter than is usual with cream of tartar; though not calculated to deceive an adept, it would, when mixed with cream of tartar in *proper proportions*, pass the observation of most buyers.

Very truly yours,

CHARLES BULLOCK.

The Action of Medicines in the System; or, "On the mode in which Therapeutic Agents introduced into the stomach produce their peculiar effects on the animal economy." Being the prize essay to which the Medical Society of London awarded the Fothergillian Gold Medal for 1852. By FREDERICK WILLIAM HEADLAND, M. D., B. A., F. L. S. &c. Third edition, revised and enlarged. Philadelphia. Lindsay & Blackiston, 1859. pp. 469, octavo.

This book has been too extensively read, and too well received by the medical profession of this country, to need a notice in this journal. The subject is one of the utmost interest to the philosophical physician who aims at something more than merely curing in an empirical way. He wants to know the how, and the why, in employing remedies. To such, this new edition of Dr. Headland, improved as it is by a most careful revision, in view of the latest investigations in Zoochemistry, will be highly acceptable; and to that other large class, who have not yet entered as students in this department of their profession, it offers an admirable introduction to the abstruse and difficult, but deeply interesting, subject "of the action of medicines in the system."

The book is well printed on good smooth paper, and neatly bound, altogether creditable to the publishers.

The Physician's Visiting List, Diary, and book of Engagements for 1860. Philadelphia. Lindsay & Blackiston.

Our medical friends will be pleased to learn that this useful little companion and advocate of order, has appeared in its new dress, ready for the approaching year. Those who have had it, will not be without it;—those who have not yet tried it, should not fail to get it.

OBITUARY.

JACOB BELL, President of the Pharmaceutical Society of Great Britain, and Editor of the (London) Pharmaceutical Journal, died on the 12th of June, at Tunbridge Wells, Eng., of *laryngeal phthisis*. Jacob Bell was the son of John Bell, who, from 1798 to the period of his death in 1849, over fifty years, pursued the business of a chemist and druggist in Oxford street, London. We have not the data to describe Jacob Bell's early career, though we believe his pharmaceutical education was conducted in his father's establishment in Oxford street. Had he not been a pharmacist it is probable that he would have been an artist. From early life he had a strong taste for the pencil, especially for sketching animals. "At one time he placed himself in one of the schools of painting in which some of our best artists have studied, but on his becoming acquainted with Sir Edwin Landseer, the productions of the pencil of the great animal painter appeared to him to so far excel anything that he could hope to attain, that he abandoned the attempt in despair. But though he relinquished the idea of becoming an artist himself, he remained devotedly attached to, and a liberal patron of art, as well as the friend of artists during his life." He proved a warm friend of Landseer, and was the means of rescuing him from the picture dealers, and in 1841, when Landseer's health required absence from his professional labors, Mr. Bell accompanied him during a six months tour to Geneva. Some of the best specimens of this distinguished artist were possessed by Mr. Bell, and these, together with the rest of his valuable collection, were bequeathed to the National Gallery at London.

It was not until 1841 that the subject of this notice was called upon to give public evidence of the energy and perseverance which has so strongly marked his subsequent career. In that year Mr. Hawes introduced his famous Medical Reform Bill into Parliament, which bore so stringently upon the pharmacutists that a public meeting of that class was called, and measures taken with such good effect that the bill was withdrawn. In this affair Mr. Bell was a prominent actor, and it was during a meeting of the committee having that in charge, at the house of Mr. Bell, that a series of resolutions were proposed and adopted which resulted in the formation of the Pharmaceutical Society. From that time till his death he devoted himself unremittingly to the interests of that Society, and through it to his brethren throughout England and Scotland. At his own expense he commenced the publication of the "Pharmaceutical Journal and Transactions" in July 1841, and distributed it largely; and among the many wise and efficient measures then suggested and carried out, none have proved more widely useful to the pharmaceutical body of England than this; for, being the mouth-piece of the Society through its transactions, and every member of the Society subsequently receiving it as a part of his privileges and rights, the information of its pages reached into all the cities

and towns where its three thousand members resided. Mr. Bell retained the copy-right of the Pharmaceutical Journal till a short period before his death, when he took measures for its transfer to the Society, and its 18 volumes will ever stand as a lasting monument to his energy and ability. He also bequeathed the sum of \$10,000 to the Pharmaceutical Society to promote the efficiency of its School of Pharmacy. It was not only by his exertions in London and through his "Journal" that Jacob Bell influenced the progress of pharmacy in Great Britain. He was constantly in attendance at meetings in other cities, encouraging them to carry out the principles of the Society, and raise their status by educational exertions. Eminently practical in his views, he was readily understood and appreciated when he addressed their meetings, and no member of the Society was listened to with greater respect.

In his last annual address in May, 1859, which, owing to the infirmities of Mr. Bell, was read for him, he explained the method by which he had been able to succeed in accomplishing so much in the early up hill labors that resulted in the firm establishment of the Pharmaceutical Society. He observed the following rules: *First*, Never to take offence at any reception, however cool, abrupt, or even rude. *Second*, Not to be discouraged at a cold shoulder. *Third*, Not to look down on a man because he lives in a small shop or in a back street. *Fourth*, Never to lose sight of the main object from a mistaken notion of dignity or self respect. *Fifth*, Never be goaded into a quarrel or loss of temper. These rules were characteristic of Mr. Bell under all circumstances. We have watched his career from 1841 to the period of his demise, as exhibited in the progress of Pharmacy in England, especially in what may be called the politics of the Society, and in cases where jealousies were engendered between the London and provincial members regarding important measures, by the unwise and unprincipled opposition of certain parties. These, to gain their ends in opposing and destroying the standing of Mr. Bell, would have sacrificed the Society, and for three years they supported and edited a periodical and filled its pages with a series of editorials which remain a lasting stigma on their author. To these biting sarcasms and caustic sneers, Mr. Bell opposed a steady and unruffled pursuit of the great interests of the Society. In a letter received from him in January, 1853, speaking of the opposition of those parties to the Pharmacy Act, he says: "We take no heed of such attacks, but go forward endeavoring not to deserve them, and attributing any hostility to the frailty of human nature."

In 1850, with the interests of the Society fully in view Mr. Bell aspired to a seat in Parliament, and successfully contested the borough of St. Alban's then vacant; circumstances occurred, however, during the canvass of a nature highly disgraceful to those that were concerned in them, and Mr. Bell, a novice in political wirepulling, was victimized, by having to bear much of the odium belonging to the party who elected him, and was finally unseated.

Whilst in Parliament he was instrumental in obtaining an "Act" to

reorganize the Pharmaceutical Society as an educational Institution, and granting it powers, which, though not so ample as would have most effectually served the cause of reform, yet greatly adding to its efficiency and dignity. "But Mr. Bell's health had long been declining; his naturally active disposition, and the enthusiasm with which he engaged in many public pursuits, caused him to overtax his physical powers, and thus was laid the foundation of a distressing complaint, which deprived him of his voice, and rendered the act of deglutition a source of extreme suffering. Throughout life he had manifested a remarkable disregard of his own personal ease and comfort, especially when business of importance claimed his attention, and this, which almost amounted to a reckless neglect of the requirements of nature, continued long after the commencement and no doubt contributed to the aggravation of his illness." "In disposition he was most kind and generous. Though he was never married, he had relatives towards whom he acted the part of a father, and the number of those is not few who have cause, gratefully, to remember his unostentatious benevolence."

When viewed as a scientific man Mr. Bell does not rank as high as some of his Pharmaceutical contemporaries. So far as we are aware, he has left nothing on record that exhibits a practical familiarity with chemical science as a pursuit. Nevertheless, in all that is considered requisite in practical pharmacy—judgment of drugs—medical botany—the details of the *English* pharmaceutical laboratory, and especially in that varied knowledge required in conducting a large dispensing establishment he was perfectly familiar. His position as editor of the *Pharmaceutical Journal* for so long a period made him acquainted with scientific literature, and brought him in contact with the best minds in the profession. Added to this he appears to have given his time and attention to the profession at large in the form of unremitting endeavors to advance their interests as a body. No amount of labor was too much for him in that direction, and with his multitudinous engagements in this and other connections he could give but little time to abstract science. In one of his letters to us, dated March 4, 1856, he says: "I believe I must plead guilty to having too many irons in the fire, as I am on several committees of hospitals, dispensaries and other institutions, besides parochial boards, and occasionally a dash at politics (chiefly medical politics, or matters bearing on that class of subjects.) In the midst of this accumulation of occupations, I occasionally find that I have neglected something or delayed answering a letter, or only half done it; the principal reason being that there is only six days in the week (besides Sunday,) and only 17 hours in each day (besides *hore somni*.)"

Perhaps Mr. Bell's most distinguishing trait of mind was a practical good sense in dealing with the pleasures, the duties and the difficulties of life. It never forsook him, and at the last moment, when all that he felt so deeply interested in, and had so much cause to wish to continue among, was fading from his view, he calmly selected a spot for his last resting place, beside the grave of the late Dr. Golding Bird, and quietly passed away without a murmur.